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In This Issue

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RAILWAY AGE

Will We Have State Socialism?

That government ownership of railways will be adopted by 1940, and the rest of private enterprise will fall "an easy and inevitable victim," was predicted recently by Dr. Virgil Jordan, president of the National Industrial Conference Board. The ability and courage with which Dr. Jordan has been discussing the prevailing socialist-labor government policies has commanded our admiration. We dissent, however, from his prediction of government ownership of railways. Similar predictions made when government operation of railways was adopted in 1918 were not fulfilled because of the conservative reaction of public sentiment that occurred.

The railroads until recently were the only large American industry subjected to comprehensive and detailed regulation of every phase of its financing, management, operation and relations with labor. There was then danger that socialistic politicians and labor leaders, aided by business men devoid of economic principles, would drive the railways into government ownership by making private ownership unable to finance its continued existence. All finance, industry and commerce are now being subjected to drastic government regulation and coercion. As time passes it will become more plain, as Dr. Jordan intimates, that if the railroads pass into the hands of the government, other private enterprise, due to the same causes, will fall "an easy and inevitable victim." The consequent increasing resistance to state socialism will increase the resistance to socialization of the railways and the real question is as to whether the resistance to state socialism will be effective. If so, it will prevent government railway ownership.

Post-War Experience in Europe

Experience within recent years in Europe may forecast developments here. In almost every European country following the war there was a movement toward the establishment of a socialist labor state. The result in most cases has been a reaction to the "right." Fascism in Italy, Nazi-ism in Germany and Austria, the recent overthrow of the cabinet in France, have all been the results of reactions against socialistic policies as well as against inefficient, wasteful, and corrupt parliamentary government. The British have remained faithful to democracy and parliamentary government, but after a trial of labor government, socialist policies and doles, they voted by an overwhelming majority to establish a conservative government, which has reversed the radical policies previously tried.

The American people, in their thinking and action regarding government policies, are most like the British, but usually turn radical or conservative a few years later than the British. We predict this will occur again—that the radical policies now being followed in this country will cause a reaction of sentiment which, within a very few years, will replace them with conservative policies—perhaps too conservative. The radicalism of the nineties was followed by extreme conservatism. The policies of Wilson created a desire for "normalcy" and helped elect Harding.

Why We Will Swing to the Right

Those responsible for the present government policies are proceeding upon the assumption that the wage earners are an all-important class, economically and politically. In 1930, the number of persons gainfully employed in the United States was about 49,000,000. These included 3,000,000 professional persons, 10,000,000 "proprietors, managers and officials," including farmers, 2,000,000 salesmen and 1,000,000 accountants, bookkeepers, etc. This 16,000,000 persons, and the many foremen and skilled workers who desire opportunity for themselves and their children to rise to positions and affluence, constitute our "middle class," and are the brains of the nation. The influence upon them of the thus far highly successful propaganda which has been carried on from Washington will rapidly decline when they find that radical policies are not only hurting the rich, but most of them also, by curtailing their incomes and increasing their taxes. A large part of other classes will follow them. Most politicians care for nothing but votes, and don't care how they get them. They will turn conservative fast enough when sentiment begins to change.

In no other country does mass-sentiment change as

in the United States. Five years ago it accepted the "new era" and Herbert Hoover as its prophet. Today it acclaims the "new deal" and President Roosevelt as its prophet. The "new deal" can no more accomplish what is expected of it than the "new era" could be perpetuated. A swing of mass-sentiment to the right in future, if conservatives fight for their principles, is as certain as was its swing to the left in a depression. If the new dealers are wise they will profit by experience, become more conservative soon and give private enterprise a chance. Dr. Jordan is right as to what would happen to the railways and private enterprise if the swing to the left should continue. He is wrong, because the swing to the right will occur in time to save private enterprise.

Labor Troubles of Railways and Other Industries

Meantime, those who have had experience with government regulation of railways can smile at the consternation caused many leaders in other industries by their labor troubles. Just before the National Recovery Act was passed last June a manufacturer was telling a railroad man what his group of manufacturers were going to do under their prospective code. "You will not do these things," said the railroad man. "Why?" "Because," replied the railroad man, "you will find labor leaders have so much more influence in Washington than you have." A wise man once said, "Experience is the best teacher, but anybody is a fool who can't learn from anybody's experience excepting his own."

The railroads have had a great many years of experience with government regulation, but leaders in other industries apparently did not learn much from it. They criticised railway managers because, as was claimed, they were not capable of managing as progressively, efficiently and economically as manufacturers of automobiles, for example.

Then the government offered codes of fair competition as a means of escape from the trammels of the anti-trust law. Leaders in many industries almost trampled upon each other in the hotel lobbies in Washington in their rush to take advantage of the new government "partnership" with business. To their surprise and chagrin, they found that labor union leaders were there first, demanding, with government backing, that the codes should include provisions for "collective bargaining" with national labor unions only; and recently the demand has been supported by threats of nation-wide strikes and coercive legislation.

Need for More Business Statesmanship

We submit that business leaders who have been surprised and outraged by these developments are less observing and intelligent than they have thought themselves. Just what experience had there been in this country to make them believe that, under government regulation, labor leaders would have less influence than business men? Were they unaware of the way President Wilson and Congress forced the basic eight-hour day upon the railways by the Adamson Act in 1916 under threat of a nation-wide strike? Did they not observe how Congress, under pressure from the labor leaders, extracted the economy teeth from the Emergency Transportation Act of 1933? Railway managers could have told other business men that the only way to avoid political and labor union dictation in an industry is to avoid government regulation of it. But most leaders in other industries could not learn anything from railway experience because they knew they were so much abler than railway executives. Consequently, for their own purposes, they stuck their heads through the noose of government "partnership," and have found themselves in labor difficulties such as are quite familiar to railway managers.

The American business leader usually is a better executive, but a much worse statesman, than the British business leader. Most British business leaders long since learned that they must know something about economics as well as their own business, that a reputation for good faith in dealing with their stockholders and the public was an asset, and that it was desirable for them to participate in politics. Scandalous abuses of trust in business, of which so many recently have been exposed in this country, are very rare in England. Sir Josiah C. Stamp, chairman of the London, Midland & Scottish Railway, is one of the most eminent economists in Europe. Many British business and professional leaders are members of parliament. The business leaders of the United States generally have shown a remarkable incapacity in economics and politics since the Great War, and the entire capitalistic system has been brought into disrepute because so many of them have disregarded the plain rights of investors as well as the public.

Confronted with the problems of old countries, this no longer new country needs statesmanship as well as executive ability among its business leaders. Statesmanship requires a broad knowledge of large economic problems gained by hard study, and a willingness and ability to help solve them which are not compatible with the unrestrained exercise of private power and greed. Abuses in private business, however efficiently managed, make it difficult to defend against socialistic attacks. If recent developments shock American business leaders into a realization of their need of economic knowledge and statesmanship they will, in the long run, be beneficial to business and the public.

Recovery and the Durable Goods Industries

Demonstrable previous lack of sound economics and statesmanship in private business, while they may afford a pretext, cannot however afford an argument or justification for government policies equally lacking in sound economics and statesmanship. The most important problem of economic recovery is that of reviving business and employment in the durable goods industries. The only way it can be solved is by restor-

ing the ability and willingness of other industries to increase their purchases from the durable goods industries. This can be done only by increasing the net earnings and credit of these other industries, and the confidence of their managements and of investors that they will be able to earn a return upon additional investment.

The trouble with most of those now influential in government is that they do not know or will not act in accordance with these vital facts. They criticise bankers because, as they assert, although the banks have abundant capital, bankers will not extend enough credit to help revive private business. The real trouble is, that many business concerns have not enough current or prospective net earnings to justify loans to them, and that many others will not borrow because they are afraid they will be unable to earn a return upon increased investment or that to issue securities will subject those responsible to the pains and penalties of the new securities act. Increased net earnings, and confidence in the future, are essential to a complete revival of business. Government labor or any other policies that undermine both may promote "reform," but not recovery.

The Railway Example

Take the railways, for example. They need to make much larger maintenance and capital expenditures, but in order to do so must largely increase their net earnings. Theoretically, they may get capital at present by borrowing either from the government or from private investors. When they were offered loans from the government's public works fund it was understood that little or no collateral would be required. They have borrowed much less than was expected because Uncle Sam —known abroad as "Uncle Shylock"—showed the same disposition in drawing contracts as private investors to demand ample security either in the form of earning capacity or collateral. Consequently, the roads which most need loans have been the least able to get them. Why should government officials lambast bankers for refusing to lend on poor credit when the government does the same thing?

The car loadings and gross and net earnings of the railroads are increasing. Car loadings are 40 per cent larger than a year ago, and relatively the largest since October, 1931. Continued increase in the net earnings of the railroads will rapidly restore their credit and enable them largely to increase their buying from the durable goods industries. But suppose Congress should pass some of the numerous bills backed by the labor unions to reduce working hours and increase wages, limit the length of trains, establish national boards of adjustments and create pension systems. Suppose the 10 per cent deduction from basic wages should be discontinued. The resulting increases of operating expenses would reduce or wipe out the net earnings of the railroads, prevent restoration of their credit, disable them from borrowing either from the government or private investors, and virtually stop their purchases from the durable goods industries.

Natural Business Revival—or Strangulation?

What is true of the railroads is true of other industries that are increasing, or desire to increase, their purchases from the durable goods industries. Increase their losses or curtail their net earnings by prematurely and unduly increasing their pay rolls, and you will immediately reduce or destroy their credit, the confidence of investors and their managements in their future, and their ability to buy from the durable goods industries. Some government officials answer that the government will arrange to make loans to industries that its policies render unable to borrow from the banks and private investors. But what business concern wants to borrow from the government to pay government-compelled increases of operating expenses? And will the government be willing to loan to business concerns without credit at the banks? If so, why does it not loan to needy railroads without credit?

General business is improving. Gross and net earnings of most industries are increasing. If the improvement is not interrupted by further government action that scares investors, and the securities act is reasonably changed, private business probably will rapidly become able to finance its own recovery. If those who determine government policies desire recovery, and not merely "reform," and have learned anything about economics, they will do nothing further to increase the operating expenses of business or scare investors. They will then get a large amount of credit they will not deserve for the improvement of business. If they continue to use artificial measures of both stimulation and strangulation they will make it demonstrable that they have handicapped and delayed recovery, and will intensify the swing of public sentiment to the right which is sure to come, anyway.

Pennsylvania Steel-Sheathed Automobile Car

Pennsylvania Builds New Automobile and Flat Cars

The former, equipped with loaders, have unusual roof construction—The flat cars have cast-steel frames

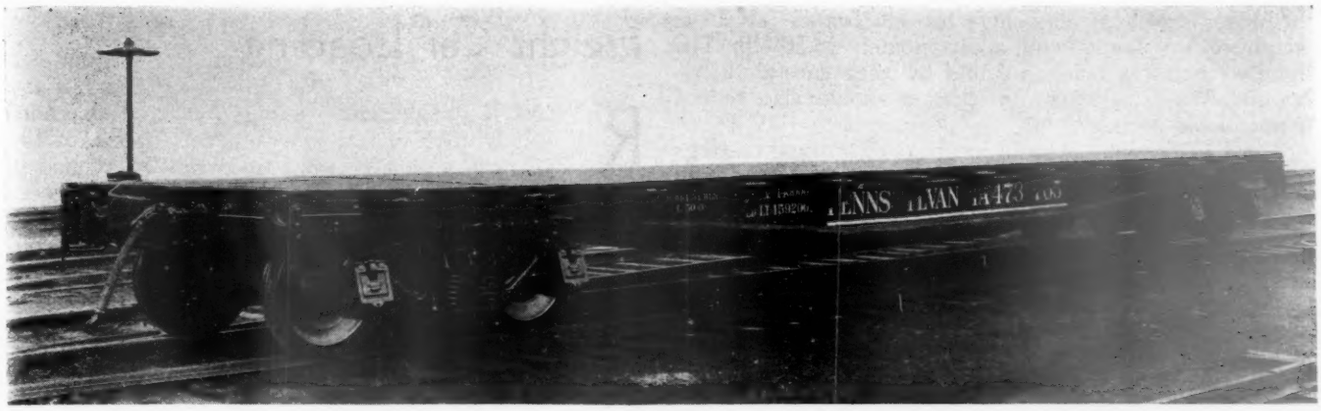
INCLUDED in the 7,000 new freight cars now being built by the Pennsylvania at its Altoona, Pitcairn and Enola shops are 500 type X-31 automobile box cars equipped with loaders and 1,500 flat cars of an entirely new type, classified as F-30-A. Three thousand automobile box cars are also being built without automobile loaders, in addition to 2,000 steel box cars with standard dimensions.

The design of the new X-31 automobile box car was worked out carefully with the automobile industry and has been approved and recommended in every detail by the Automobile Chamber of Commerce. It is said by the automobile industry to be the type of car most likely to return automobile traffic to the rails.

The Automobile Cars

The mechanical loading devices used in the new X-31 car make possible the convenient handling and hauling of four automobiles per car, instead of the two or three automobiles now generally accommodated. The use of

Interior of Car Showing Automobile Loader Folded Under the Roof

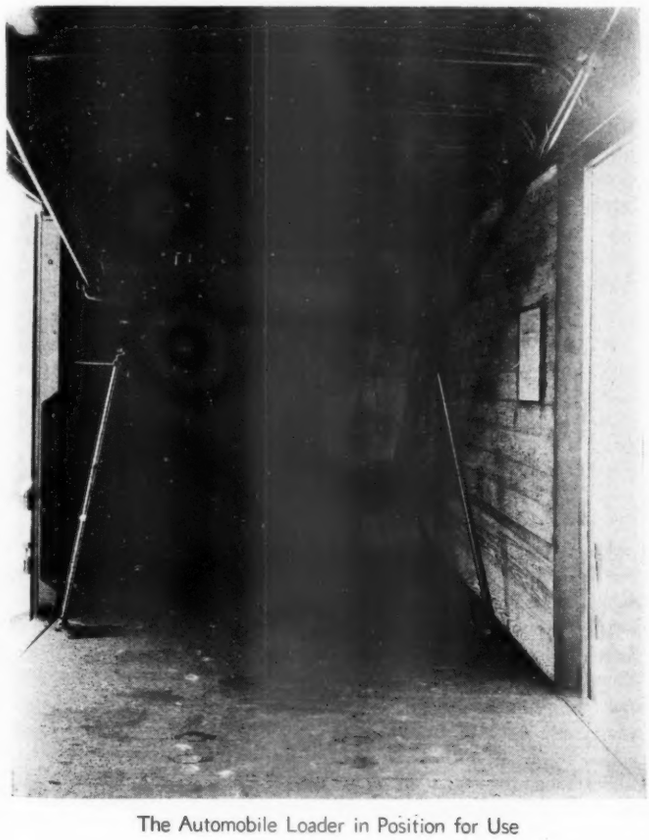


The Pennsylvania Flat Car with Cast-Steel Frame

the mechanical loader eliminates all bracing or wooden decking in motor-car shipments, saving expense to the dealer and greatly facilitating unloading. The loaders are so arranged that when not in use they are drawn up and stored under the roof so that the especially equipped cars may be quickly converted for the handling of standard box-car commodities. In the cars to be built without the loader, provision has been made for its installation later if necessary.

Another special feature of the X-31 car is its wagon-top type roof which provides greater clearance in tunnels. The general dimensions of the new automobile box car are as follows: Inside length, 40 ft. 6 in.; inside height, 10 ft.; inside width, 9 ft. 2 in.; maximum height from rail, 14 ft. 6 in.; length over striking castings, 41 ft. 8⅛ in.; coupled length, 44 ft. 2⅛ in.; distance between truck centers, 30 ft. 8⅛ in.; height to top of floor, empty car, 3 ft. 8⅞ in.

The underframe has 12-in. A.R.A. center sills, 40.3 lb. per ft., with ¼-in. by 20-in. top cover plate, and 7-in. side-sill channel, 18.8 lb. per ft. This side sill is reinforced at the door opening with ⅜-in. by 3½-in. bulb angle, 11.9 lb. per ft. Bolsters and crossbearers are of the built-up construction with pan-shaped diaphragm and top and bottom tie plates. The flooring is 2⅜ in. thick and is substantially supported at center sills, side sills and intermediate floor supports.



The Automobile Loader in Position for Use

The side top plate is a 3⅛-in. by 4 1/16-in. by 3⅛-in. by 5/16-in. Z-bar, reinforced at the door opening with a ¼-in. by 5½-in. plate. The .11-in. side sheets are riveted to this Z-bar and to the side sill, and this construction is stiffened by a number of steel side posts against which the 13/16-in. wood inside lining rests. The inside lining is properly strengthened by 1¾-in. wood nailing planks.

The side door posts are of a one-piece steel casting, round-faced on the inside. Besides making a good solid connection between the top and bottom members of the side construction, this design gives the benefit of what would be several more inches of clear-door opening when loading automobiles obliquely. The nominal door opening is 12 ft. 1½ in. and the doors are staggered 6 ft. 2 in. The ends and double side doors are of the corrugated type. The roof is of all-steel riveted design of the semi-wagon-top type and is reinforced by ten substantial carlines.

The cars are equipped with the AB air brake furnished by the Westinghouse Air Brake Company, and power hand brakes.

The nominal capacity of this car is 100,000 lb. and the light weight is 53,600 lb., including auto loaders, which gives a load limit capacity of 115,400 lb.

The trucks are of the four-wheel type, with a wheel base of 5 ft. 6 in., having standard A.R.A. 5½-in. by 10-in. journal axles, cast-steel side frames with integral journal boxes, cast-steel or pressed-steel bolster, non-harmonic spring combination and one-wear rolled steel wheels. The non-harmonic springs insure an easier riding car and better protection to the lading.

The X-31 car was designed in the office of the mechanical engineer of the Pennsylvania at Altoona.

The Flat Car

The new type F-30-A flat car has the lowest floor of any Pennsylvania flat car ever built, making it especially attractive to shippers of electrical apparatus and other high freight requiring additional clearance. The floor of this car is 3 ft. 5⅛ in. above the top of the rail as compared with 3 ft. 9⅝ in. for previous cars of this type.

The length of the car also adapts it for the more efficient handling of longer steel lengths, shapes and pipe. Of especial interest also in connection with the new flat car is the fact that the underframe is a one-piece steel casting, incorporating center sills, side sills, cross

members, draft castings, lugs for air brakes, etc., the weight of the casting being approximately 25,500 lb. The light weight was made possible by very careful distribution of metal. This construction should also reduce maintenance costs.

The F-30-A flat car has a length over striking castings of 50 ft. and truck centers of 39 ft., leaving 5 ft. 6 in. from center line of bolster to striking castings. Width over flooring is 9 ft. 3 in. and stake pockets have been provided and located so that requirements for pockets for flat cars as well as for container cars have been satisfied.

The car is designed to carry load limit capacity concentrated at the two crossbearers located 6 in. on each side of the center line of the car. The center sills at the draft pocket are spread the standard 12⅞ in. apart, but are gradually spread further apart from the bolsters to the crossbearers. Between crossbearers this width is 34 in. Thus the center sills have been designed to carry approximately 74 per cent of the capacity lading, plus their own weight and the end shock caused by buffing.

The center-sill web is ¾ in. thick and the top flange is 14 in. wide, providing a good surface for the 2⅜-in. oak flooring. The bottom part is bulb shaped.

The side sill is substantially the same design as the center sill, although lighter and has a top bearing surface for the floor of 10 in. It is designed to carry its own weight, plus 13 per cent of the lading. The crossbearers are strong enough to transfer loads from side to center sill, or vice versa.

The floor is bolted to the side and center sills. Both the center and side sills are of uniform depth between crossbearers and then decrease gradually in depth toward the bolster.

The car is equipped with the AB air brake furnished by the Westinghouse Air Brake Company. The trucks are of the four-wheel type, with a wheel base of 5 ft. 6 in., having A.R.A. 6-in. by 11-in. journal axles, cast-steel side frames with integral journal boxes, cast-steel bolster, non-harmonic spring combination, and single-wear rolled-steel wheels.

The nominal lading capacity of the car is 140,000 lb., with a load limit of 159,200 lb. and light weight of 50,800 lb. It was designed in the office of the mechanical engineer of the Pennsylvania in collaboration with the General Steel Castings Corporation.

The new freight cars now under construction by the Pennsylvania in its three shops are part of the road's $77,000,000 electrification and improvement program financed by the Public Works Administration.

* * *

Canadian Pacific Train at Vancouver (B. C.) Station

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 17 totalled 625,773 cars, an increase of 13,371 cars as compared with the week before and of 172,136 cars as compared with the corresponding week of last year. This was also an increase of 41,014 cars as compared with 1932. Loading of miscellaneous freight, grain and grain products, forest products, ore, and live stock showed increases both as compared with the week before and as compared with last year, but merchandise, coal, and coke showed reductions as compared with the preceding week. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading
Week Ended Saturday, March 17, 1934

Districts	1934	1933	1932
Eastern	150,845	103,552	138,138
Allegheny	126,899	84,118	116,634
Pocahontas	48,202	31,767	39,764
Southern	96,633	73,451	89,899
Northwestern	69,458	52,252	66,907
Central Western	84,469	68,647	85,290
Southwestern	49,267	39,850	48,127
Total Western Districts	203,194	160,749	200,324
Total All Roads	625,773	453,637	584,759
Commodities			
Grain and Grain Products	31,952	26,750	29,890
Live Stock	14,037	12,293	16,183
Coal	148,159	89,277	131,073
Coke	8,760	4,349	6,839
Forest Products	25,164	14,530	20,307
Ore	4,010	2,486	3,267
Mdse. L. C. L.	166,129	153,176	187,192
Miscellaneous	227,562	150,776	190,008
March 17	625,773	453,637	584,759
March 10	612,402	441,361	575,481
March 3	604,137	481,208	559,479
February 24	573,371	462,315	535,498
February 17	598,896	517,529	572,265
Cumulative total, eleven weeks	6,328,783	5,270,980	6,229,711

Car Loading in Canada

Car loading in Canada for the week ended March 17 totaled 43,612, an increase of 118 over the previous week and 7,726 cars over the corresponding week in 1933, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
March 17, 1934	43,612	26,007
March 10, 1934	43,494	26,023
March 3, 1934	42,610	25,916
March 18, 1933	35,886	16,561
Cumulative Totals for Canada:		
March 17, 1934	448,966	248,441
March 18, 1933	360,683	187,493
March 19, 1932	455,275	235,025

PLANS OF THE NEW YORK CENTRAL to enter the airplane business are likely to come to a focus this spring or summer, if conditions at that time seem favorable. New York Central officers have been investigating the matter for some time and have consulted representatives of the United Air Lines, American Airways and others. No definite arrangements have been made with any particular company, but probability is that the railroad will operate in conjunction with an established air line rather than attempt to organize its own aviation unit. It is understood the railroad contemplates air service only in the territory now served by its rail lines.

Proper Investment Built Into Lehigh Valley Tracks Has Been of Great Benefit During the Last Four Years

Proper Investment and Modern Methods Will Yield a Return*

Expenditures for and practices in maintenance of way on the Lehigh Valley have resulted in high standards and large savings

By G. A. Phillips†
Chief Engineer, Delaware, Lackawanna & Western

I WAS invited to describe how it is possible for a railroad to secure a return on proper investment in roadway and structures. To this end I shall confine my remarks to the history of the Lehigh Valley during the period from 1910 to date, on which road many investments were made which have yielded large returns.

The Lehigh Valley operates a double-track railroad, with many miles of third and fourth tracks, from New York, through the Allegheny mountains between Allentown, and Wilkes-Barre, Pa., to Buffalo, N. Y., a distance of 450 miles. The road comprises a total mileage of about 3,400, including branch lines extending throughout the anthracite region and leading to ports on Lake Ontario. It carried a gross tonnage of 39,000,000 in 1910, 46,000,000 in 1926, and 23,000,000 in 1932.

A bird's-eye view of the property in 1910 would have revealed a track structure composed of rail not exceeding 90 lb. per yard; untreated ties throughout; stone ballast inadequate and not cleaned since installation; and automatic signals of the lower quadrant and banjo types operated by primary batteries and lighted by oil and gas. Interlocking plants were largely of the mechanical type, without advance locking; telegraph and telephone lines were made up of small poles and long spans; main line bridges were designed for E-40 or E-50 loadings and were entirely of open-floor construction, many of the shelf-angle type; truss bridges were largely pin-connected, while all bridge ties were untreated. Wooden bridges on branch lines were of the trestle type, with untreated open-floor decks.

So much for conditions as of 1910. Since that time, changed operating practices, heavier wheel loads and increased speeds have made necessary the reconstruction of the property and, as will be shown later, this reconstruction resulted in a great reduction in operating expenses, while at the same time noticeably bettering the property.

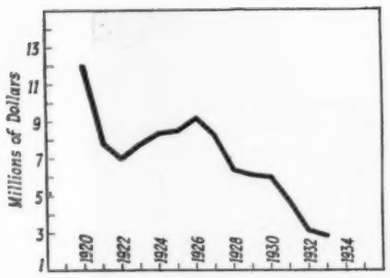
I was connected with the Lehigh Valley in one capacity or another for practically the entire period under discussion and saw all of the various stages of reconstruction, but it was my immediate predecessor as chief maintenance officer, who had the courage and the foresight to convince the management that different methods had to be adopted, that improved materials had to be purchased, that structures had to be strengthened, signals improved and a general rehabilitation instituted.

Drainage, Ballast and Ties Considered

Track can well be divided into four parts, namely; sub-grade, ballast, ties and rail. A foundation is necessary, and, with this in mind, drainage was provided in

*Abstract of a paper presented before the New England Railroad Club at Boston, Mass., on February 13.

† Mr. Phillips was chief engineer maintenance of the Lehigh Valley until February 1, when he became chief engineer of the Lackawanna.



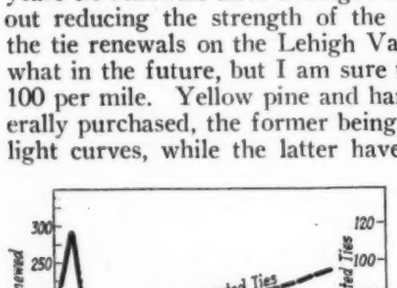
Total Maintenance of Way Expenditures

practically every place that required it; sometimes of the sub-drainage type, and other times of the open-ditch type. Side ditches were provided in cuts and side-hill slopes, banks were widened to reasonable width for supporting the track and ballast, and these were thoroughly protected with riprap where necessary to prevent scour by streams and, at the same time, to eliminate frost difficulties.

Nothing at great length can be said for ballast. Over a period of years the quantity under the ties was increased from a veneer to at least 14 in., and probably 18 in. in many places, brought about by surfacing in cycles averaging four years each. A good quality of hard limestone was used for ballast, prepared of a size to pass over a 1¼-in. and through a 3-in. ring. It seems essential to avoid the so-called "run-of-crusher" stone as this restricts the percentage of voids in the ballast.

One of the largest items of expense which annually confronts a railroad is that for tie renewals. In 1910 the Lehigh Valley began to use creosoted ties and creosoted switch and structural timbers exclusively. All ties and timber on this road have been treated under the "Lowry" or "empty cell" process, which consists of submerging air-seasoned timber in a retort of creosote at 200 deg. temperature and atmospheric pressure, and then applying pressure until the timber takes up a predetermined amount of the preservative. When the pressure is released, the surplus oil is drained off, this being followed by a quick strong vacuum to recover the free oil. The early treatment employed provided for the use of straight creosote, but in later years the road has been using a mixture of 70 per cent oil and 30 per cent coal tar. This percentage was changed recently, for pine ties and switch timbers only, to 60 per cent oil and 40 per cent tar.

Prior to the use of creosoted ties, the annual tie replacements on the Lehigh Valley were approximately 250 per mile. After a 12-year period, this was reduced to below 100 per track mile, in spite of increasing the number of ties, from 16 to 18 ties per 33-ft panel of track to 20 ties per rail length. During the last five years tie renewals have averaged only 50 per mile, without reducing the strength of the property. I look for the tie renewals on the Lehigh Valley to increase somewhat in the future, but I am sure they will never exceed 100 per mile. Yellow pine and hardwood ties were generally purchased, the former being used on tangents and light curves, while the latter have been used on heavy



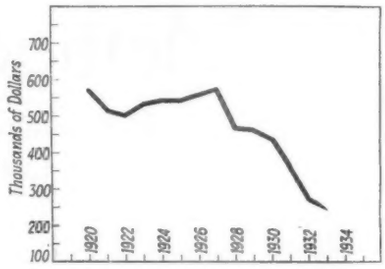
Tie Renewals Per Mile of Track

curves. In recent years the purchase of hardwood ties has been restricted to oak, and, since 1926, all ties have been pre-adzed and bored. I think the greatest benefit from the latter practice is the more effective and increased penetration of the preservative into the wood.

Heavy Rail Adopted Early

During the period from 1910 to 1915, a great amount of attention was given to improving the sub-grade, ballast and ties. At the same time, the size of the rail was increased from 80 and 90 lb. to 100 and 110 lb., with 100-lb. rail predominating in the track in 1915. With the steady increase in wheel loads, it was felt necessary to go to a heavier section of rail; one that would meet requirements for many years and perhaps all time. Therefore, in 1915, a rail weighing 136 lb. per yard was designed and has been purchased exclusively since, with the exception of a very small tonnage of 100-lb. rail for emergency purposes. The 136-lb. rail was 7 in. high and 6½ in. wide at the base, with a moment of inertia of 86.0, and generally good proportions throughout. This rail was redesigned slightly in 1927, providing a height of 7⅜ in. and a moment of inertia of 98.5, without increasing the weight or width of base, but with additional fishing space.

The 136-lb. rail is of the girder type, that is, it supports the heavy wheel loads with minimum deflection, thereby reducing the wave motion, which is a disturbing element and the cause of heavy track maintenance



Maintenance of Way Expenses—Account 201—Superintendence

expense. This large section allowed the carbon content to be increased, making the rail harder and providing more resistance to wear, particularly when used on the sharp curves.

Rails in recent years have been purchased in 39-ft. lengths, but in 1929 and 1930, ten track miles of 66-ft. rail were laid, with every success physically, reducing the number of joints per mile of track from 270 to 160, or 110 less per mile. The only change I would now recommend in connection with this installation would be to make the rails longer, say 78 ft., this being a multiple of 39 and allowing more tonnage on the necessary two cars.

Rail on sharp curves on the Lehigh Valley is protected from lateral wear by rail oilers, and, at the present time, about 150 of these devices are in service. It has also been found economical to transpose the high and low rails on curves, which increases the life of the latter about 25 per cent over the original installation due to cold-rolling or case-hardening.

Large tie plates, 8 in. by 13½ in., canted 1 in 20, have been used for many years on the Lehigh Valley and have been an important factor in not only increasing the life of the ties, but also in reducing labor, as the sloping plate with a corrugated bottom practically eliminated the necessity for gaging track.

Much Work Equipment Used

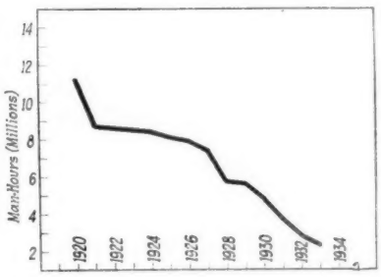
Let us now consider the component parts of the track structure collectively as track. It is necessary for all

railroads to raise and surface tracks from time to time. The majority of the surfacing on the Lehigh Valley is done with power tampers in cycles of four years. At this time all ties are removed which will not last this period or as long as the surface of the track. Such ties as can be reused are placed in secondary or yard tracks. No ties are spaced on the Lehigh Valley, nor are they dug in. In other words, everything possible is done to retain the original bed.

Rail is generally laid on this road in the late Fall or Winter, preferably at a temperature of about 32 deg., for the reason that this seems to be the most economical season. It is necessary for all roads to maintain a small winter force to meet emergencies, such as snow, along with some productive winter maintenance. However, snow handled by these men means expense with no value received. Therefore, they have been collected together and "in goes the rail."

It is a great advantage to get the rail program out of the way during the winter, as this enables one to apply his man hours to work in the summer season that cannot be performed during the winter, such as surfacing track. Furthermore, it was found to be less difficult to control expansion when the rail was laid in the winter. Open joints in the winter season cause great damage to the rails.

It seems hardly necessary to mention here the details of rail laying and the use of mechanical equipment, but generally speaking, the Lehigh Valley has all of the



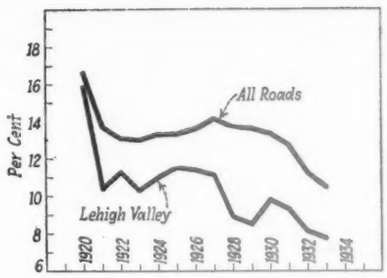
Man-Hours — Current Repairs — Maintenance of Way

various kinds and is constantly purchasing the latest devices for the various classes of work of the different departments. This road was an early purchaser of locomotive cranes, having 47 at present, largely in maintenance of way service; and the same principle applies to other types of equipment.

In the same manner that the track structure was improved, the bridges were strengthened to accommodate E-60 and E-65 loadings, with axle loads of 70,000 lb. Creosoted bridge ties were adopted exclusively, and concrete solid floors were installed where economical, together with creosoted timber solid floors for branch line bridges. Pin-connected trusses were replaced with riveted box girders. Signals were changed to the upper quadrant and position electric-light type, using commercial current, and pole lines are now in the process of reconstruction with creosoted pine poles and copper wire. Many mechanical interlocking plants have been replaced with all-electric plants.

Track Sections Lengthened

The period from 1910 to 1927 on the Lehigh Valley can be classified as a reconstruction era, although an analysis of expenses during this period will not disclose extravagances, and the maintenance of way ratio of the road will be seen to fall well below the average for the country. This has been the result of the kinds of materials purchased and the manner in which they were applied, two of the early principles in effect on this



Ratio of Maintenance of Way Expenses to Operating Revenues

road being to avoid all unnecessary and non-productive work, so far as possible, and to improve the methods of performing work in the interest of increased efficiency and economy.

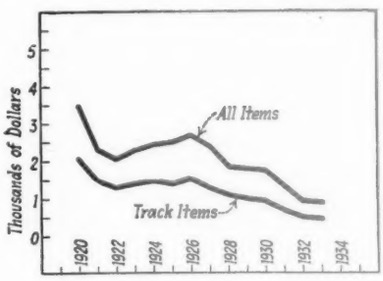
Early in 1928, before the general decline in business, it became necessary for the maintenance of way department of the Lehigh Valley to scrutinize expenses carefully. This was because of a sharp falling off in anthracite coal tonnage, together with an increase in compulsory non-productive expenditures, such as for train control and the abolition of grade crossings. With normal maintenance of way expenditures chargeable to operation running about $8,000,000 annually and revenues about $70,000,000, it became necessary to reduce expenses with the decline in earnings. The second half of this story deals with the years 1928 to date, and will show returns on investment that were very gratifying in a very distressing period.

One of the first thoughts to present itself, considering the character of the track structure, with its heavy rail, healthy tie condition, adequate stone ballast and proper drainage, was that of lengthening track sections. The ordinary double-track main-line section was about 4½ miles long, with allowance made for yards, sidings and running tracks. It was thought that this length could well be doubled, and, without any extended scientific investigation, this was done, resulting in decreasing the number of sections from 302 to 131. Individual outlying double-track sections became about nine miles long, regardless of the number of units, and branch-line sections became from 12 to 20 miles long, depending upon traffic conditions. This alone resulted in an annual payroll saving of $308,000.

Furthermore, thought was given to the old-fashioned "track walker," with his wrench, dinner pail and umbrella in hand. As a result, track walking was abolished, substituting motor car patrols where necessary, and requiring every gang and supervisory officer moving over the road to be watchful. This reduced the annual payroll another $240,000.

Rail and Bridge Welding to Effect Economies

Along with other things, overhead expenses were scrutinized carefully on the Lehigh Valley, referring in particular to the Interstate Commerce Account —"Superintendence." As a result, operating divisions were combined, effecting savings of $300,000 annually. Along with the combining of divisions, all repairs to main-



Maintenance of Way Expenses Per Track Mile

tenance of way equipment were centralized, eliminating the division organizations. Payroll savings were not the only benefits derived, for more uniform and refined results were obtained.

Electric and gas welding in both track and bridge work are resorted to to a large extent, together with some thermit welding of rails in station platforms. Over 900 track miles of rail have had their ends built up since June, 1932, along with the necessary frogs and switches. This has resulted in marked savings other than in rail renewals, and, naturally, has greatly improved the riding qualities of the track. With a traffic of about 25,000,000 gross tons annually, the Lehigh Valley hopes to secure an average rail life of 17 years. In effecting this, it is expected that the rail oilers in service on sharp curves will play an important part. These oilers have a bearing on the tonnage of trains, as well as in decreasing tire and flange wear. They also minimize the necessary transposition of rails on curves. The use of the fissure detector car, when necessary, is also a factor in the increased life of rail.

Excess Buildings and Work Trains Eliminated

Changes in operating conditions required an analysis of tracks, buildings and other structures to eliminate the non-essential. This was done, with a result that 150 miles of tracks, 350 buildings, 66 automatic signals and 14 interlocking plants were removed, saving future maintenance or renewal costs and annual taxes, in addition to conserving the cash outlay for material by securing considerable salvage. This procedure netted the road $70,000 annually in taxes and maintenance, with a salvage value of $410,000 (largely scrap and good second-hand rail), and required a cash outlay of only $150,000 to accomplish.

The subject of work trains was also given special attention. Not so long ago when a roadmaster was mentioned, one automatically thought of work trains. In other words, a work train was accepted as a necessary evil. In 1927, the Lehigh Valley had about 3,000 work-train days chargeable to current expenses, of which the majority were in the track department. By a strenuous campaign of education, and with fine co-operation on the part of the transportation department, work-train service chargeable to expenses was reduced gradually each year to 106 days in 1932 and to 159 days in 1933. Included in the 1933 figure were 119 work train days for the operation of the Speno ballast cleaning machine. The use of locomotive cranes and local freight trains instead of work trains was an important factor. It is unnecessary to show you in money what this meant.

Many Smaller Features Also Assisted

Many other smaller features have assisted in the final results. Thus, switch lamps have been eliminated, except in territory not equipped with automatic signals, and a large number were removed from yards where flood lights were in use. The derail situation was carefully canvassed and many derails were removed, particularly where they were pipe-connected to facing point switches. This resulted in savings of materials and labor, as well as in reducing the cash outlay for purchases. The substitution of metal signs with the lettering cut out similar to a stencil, for the ordinary type of painted sign, reduced roadway painting costs by about $10,000 a year. Labor camps, when necessary, are operated by the maintenance of way department without expense to the company, resulting in savings and improvement in culinary and living conditions. Consolidation of electric power purchases was effected at all points to secure the lower rates based on large consumption. The long rails, previously referred to, afford, in my opinion, an opportunity for considerable saving to the railroads of this country.

Care in Purchase and Use of Equipment

Ballast cleaning has always been a discouraging problem and much neglected. It is possible by present methods, however, to clean the entire Lehigh Valley in one season, with one machine, if necessary, and at low cost. Its troubles in that respect are over, and the road can now utilize its locomotive cranes for other work.

There is more to ballast cleaning than drainage. It increases the bulk of stone, reducing requirements for ballast, and it also provides clean stone ahead of tamping gangs, facilitating the work and reducing costs.

Generally speaking, all types of power equipment are in use that are considered necessary and economical. On the Lehigh Valley, tractor-type machines are favored for power tamping and welding, the reasons for which are obvious.

Labor-saving equipment should be provided consistent with the economies to be derived. It is possible, however, to saturate a railroad with such equipment until you reach a point where more men are employed operating the power tools than would be required to perform the same work without the so-called modern machinery. In other words, care must be exercised not to get top-heavy with the use of machinery, and not to allow enthusiasm to outweigh common sense to the extent of increasing costs.

Labor saving equipment, as a whole, is expensive and must be utilized the maximum number of hours during the year to secure the greatest efficiency and economy. The local supervisory officer is the key to this situation and, convinced himself, he must sell the idea to his foremen and men. It is, therefore, very important to pick the right men for supervisory positions. They must be leaders, capable of pushing themselves and not require pulling along by their superior officers.

Organization is Important

Last but not least in this whole picture comes organization. This, to my mind, was the most important part of the Lehigh Valley program. There is no better barometer of failure than the results obtained at the end of the year, without a co-operative organization, as compared with the benefits possible from the same expenditure with an organization that is running smoothly. The constant vigilance of the men in the maintenance of way department of the Lehigh Valley has, in many cases, awakened their ingenuity; new ideas have been injected continually into the work; and enthusiasm is ever present. This spirit, of course, was encouraged on my part.

A standard plan should carry with it enough elasticity or flexibility to allow it to be contracted or expanded to meet a given condition, and foremen on the Lehigh Valley knew that they would not be criticised for using their heads. We aimed for simplicity and common sense, which appears to be the logical way to reach the men, and the secret of economy. A man's success is dependent, to a large extent, upon his subordinates and he should supply them with everything necessary.

Summarizing the above, the maintenance of way operating ratio on the Lehigh Valley for the last six years averaged 8.82 per cent, with a reduction in expenses from $8,310,000 in 1927, to $2,925,000 in 1933, and a reduction in man hours from 7,500,000 in 1927, to 2,300,000 in 1933. I have said very little with respect to the condition of the property, but in my opinion, there has been very little deferred maintenance on the Lehigh Valley as a result of the reductions made in expenses.

Purchases Are Still Below Par

Details for 1933 show former relation to earnings not yet restored—Variations on different roads noted

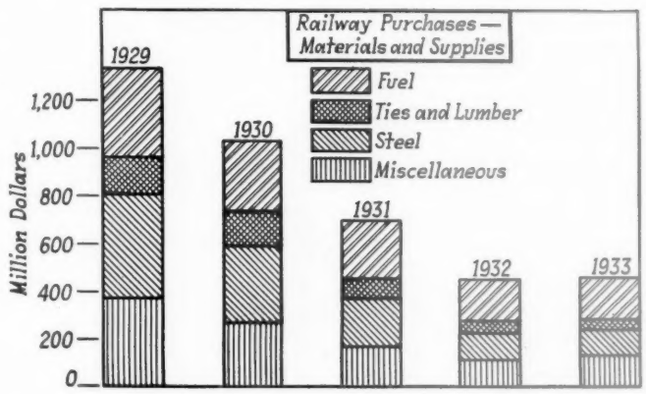
A CRITICAL examination of the expenditures made by the railroads of the United States for fuel and materials and supplies in 1933, aside from throwing more light upon the importance of the railroads to business and employment, contain heretofore undeveloped data on the comparative effect on purchases of location, differing operating conditions, etc. Details from 98 Class I railroads, operating 214,000 miles of road and earning 95 per cent of the freight and passenger revenues in 1933, while disclosing wide variations in the proportion of the supply dollar expended in 1933 for different classes of material on different roads and wide variations in the gross expenditures per mile of road operated, showed marked uniformity in the relation which the gross purchases of different roads bear to their earnings.

Purchases averaged more per dollar of earnings in the New England region and more per mile of road in the Pocahontas region and less per dollar of earnings in the Central Eastern region and less per mile of road in the Northeastern region in 1933 than elsewhere, according to the figures, and expenditures per dollar of earnings were larger on the smaller roads than on the larger roads, and were also larger on the roads in receivership than on those not in receivership. Although a slightly larger proportion of earnings was spent by the roads in 1933 for purchases than in 1932, the proportionate amount spent in the past 12 months was still under the amount spent in the five years previous to 1929.

Purchases and Earnings

As shown in a previous issue of *Railway Age**, the railroads expended approximately $457,750,000 for fuel and materials and supplies in 1933. This is equivalent to 14.60 per cent of the gross revenues and to an expenditure of $1,910 per mile of road and is contrasted with an average expenditure in the five years ending with 1929 equivalent to 20.25 per cent of earnings and $5,800 per mile of road, or, if a 25-per cent adjustment is made for price changes, to 15.50 per cent of earnings and $4,350 per mile of road in the five years ending 1929. Excluding fuel, purchases last year were equivalent to 8.9 per cent of earnings, or $1,160 per mile of road, as compared with 11.85 per cent of earnings and $3,160 per mile of line in the five years previous to 1929, or as compared with the adjusted figure of 11.30 per cent of earnings and $3,000 per mile of road. Exclusive of fuel, rail and ties, the 1933 purchases were 7.8 per cent of earnings and equivalent to $1,025 per mile of road, as compared with 11.85 per cent of earnings and $3,160 per mile of road prior to 1929, or the adjusted figures of 8.90 per cent of earnings and $2,360 per mile of road, respectively.

Purchases of iron and steel in 1933 were equivalent to 3.60 per cent of earnings and $467 per mile of road, as compared with 6.87 per cent of earnings and $1,830 per mile of road, or 5.10 per cent of earnings and $1,370 per mile of road, adjusted, while purchases of forest products were 1.32 per cent of earnings and $170 per mile of road



Expenditures of the Railways of the United States for Fuel and Materials and Supplies, 1929-1933, Inclusive

in 1933, as compared with 2.68 per cent of earnings and $170 per mile of road, and 2.10 per cent of earnings and $210 per mile of road, adjusted, in the five years ending with 1929. While the differences are much greater per mile of road, it is apparent that in so far as 1933 is concerned, the railroads are still appropriating a smaller part of their earnings for supplies than they did prior to the depression.

Regional Variations

The first analysis which has been made of railway purchases on a regional basis dispels much of the speculation regarding the state of purchases in different localities. Compared with 14.6 per cent of earnings for the United States, fuel and supplies took 17.5 per cent of earnings in the New England region, 15.4 per cent in the Great Lakes region, 11.9 per cent in the Central region, 13.2 per cent in the Pocahontas region, 15.8 per cent in the Southern region, 15.3 per cent in the Northwestern region, 15.4 per cent in the Central Western region and 16.0 per cent in the Southwestern region. In terms of mileage, gross purchases were equivalent to $2,740 per mile of road in the New England region, as compared with $1,910 for the United States and $3,340 per mile of road in the Great Lakes region, $3,180 in the Central Western region, $4,300 in the Pocahontas Region, $1,580 in the Southern region, $1,150 in the Northwestern region, $1,370 in the Central Western region, and $1,240 in the Southwestern region.

Exclusive of fuel, the purchases, which were equivalent to 8.9 per cent of earnings and $1,170 per mile of road for the United States in 1933, were equivalent to 11.1 per cent of earnings and $1,750 per mile of road in the New England region, 9.5 per cent of earnings and $2,100 per mile of road in the Great Lakes region, 7.6 per cent of earnings and $2,015 per mile of road in the Central Eastern region, 10.0 per cent of earnings and $3,350 per mile of road in the Pocahontas region, 9.9 per cent of earnings and $998 per mile of road in the Southern region, 9.4 per cent of earnings and $710 per mile of road in the Northwestern region, 8.2 per cent of earnings and $760 per mile of road in the Central Western

* *Railway Age*, March 10, 1934.

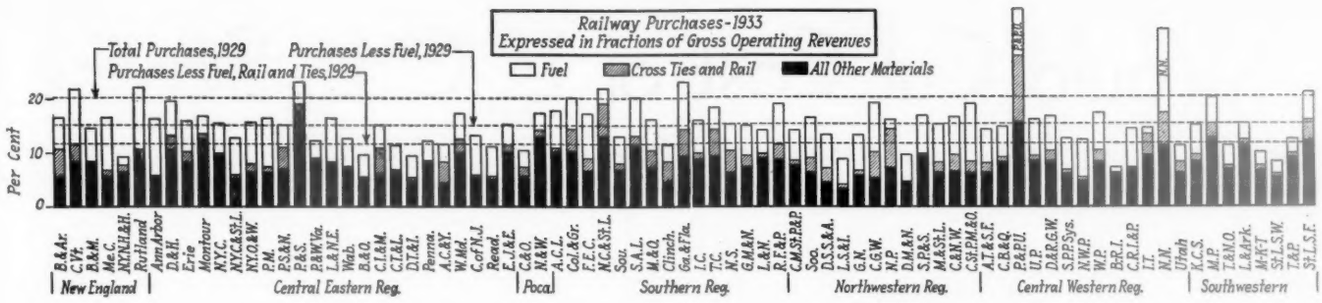
region and 11.2 per cent of earnings and $875 per mile of road in the Southwestern region.

Compared with 7.9 per cent of earnings and $1,040 per mile of road, the purchases, exclusive of fuel, rail and ties, were 9.8 per cent of earnings and $1,540 per mile of road in the New England region, 8.7 per cent of earnings and $1,870 per mile of road in the Great Lakes region, 7.3 per cent of earnings and $1,940 per mile in the Central Eastern region, 8.5 per cent of earnings and $2,860 per mile in the Pocahontas region, 8.7 per cent of earnings and $870 per mile in the Southern region, 7.5 per cent and $565 per mile in the Northwestern

Selected Divisions of Railway Purchases, 1933*

		Dollars Per Mile of Road Operated										Per Cent of Op. Rev.		
	Miles	Ties and Lumber	Wheels, Tires, Axles	Track Mat'l, Ex. Rail	Tel. and Sig.	All Iron and Steel	Oil and Grease	Copper, Lead, Etc.	Elec. Mat'l	Total Purch.	Ties, Rail, Misc.	Misc.	Total	Ties, Rail, Misc.	Misc.
New England Region:															
Bangor & Ar.	610	$355	$44	$83	$4	$410	$38	$59	$9	$1,580	$1,050	$630	16.8	10.9	6.7
B. & M.	2,081	105	145	116	59	672	79	168	33	3,000	1,600	1,600	14.8	8.1	8.0
Me. C.	1,086	200	45	24	32	190	32	55	7	1,640	660	550	16.8	6.7	5.6
N. Y. N. H. & H.**	...	...	...	...	...	...	...	...	...	2,960	2,480	1,950	9.1	7.5	6.5
Rutland	413	41	47	95	12	350	30	34	25	1,830	870	730	22.2	10.8	8.9
C. Vt.	...	...	...	...	...	...	...	...	...	2,400	1,300	925	22.0	11.7	8.4
Great Lakes Region:															
Ann Arbor	294	49	26	20	13	170	17	44	8	1,660	500	495	16.4	5.9	5.9
C. & E. I.	...	...	...	...	...	...	...	...	...	1,870	1,090	845	14.3	8.3	6.5
D. & H.	850	870	288	300	167	1,730	78	230	29	5,250	3,480	2,920	19.8	13.3	11.3
Erie	2,451	161	194	312	77	1,730	145	212	36	4,900	3,220	2,520	15.8	10.4	8.1
L. & N. E.	228	130	87	39	40	470	48	67	14	2,220	1,070	1,002	16.8	8.1	7.7
Montour	57	265	209	90	50	2,600	210	246	50	5,000	3,980	3,740	17.0	13.6	12.8
N. Y. C. Sys. (ex. B. & A.)	11,353	270	172	152	41	1,090	105	318	16	3,700	2,420	2,250	15.8	9.9	9.2
N. Y. C. & St. L.	1,690	99	55	69	30	505	81	92	13	2,400	1,080	970	13.0	6.0	5.3
N. Y. O. & W.	568	238	107	71	63	630	71	174	24	2,720	1,340	1,080	16.0	7.9	6.4
P. M.	2,296	162	39	37	15	285	28	52	14	1,600	710	595	16.7	7.5	6.2
P. & S.	102	322	9	48	3	485	40	17	11	1,593	1,292	879	23.6	19.3	13.0
P. & W. Va.	138	252	171	12	16	450	45	14	3	2,300	1,700	1,520	12.2	9.2	8.2
P. S. & N.	195	201	28	38	3	150	23	19	8	1,760	555	350	15.4	11.2	7.1
Wabash	2,480	194	32	52	29	400	46	100	18	1,890	1,050	1,050	12.9	7.2	6.9
Central Eastern Region:															
A. C. & Y.	171	365	38	182	6	153	71	32	6	1,090	775	512	11.7	8.3	5.5
B. & O. Sys.	6,504	76	53	35	24	440	74	108	32	2,100	1,070	1,070	10.0	5.6	5.6
C. of N. J.	691	175	120	128	33	780	161	60	127	5,350	2,110	2,060	13.5	5.3	5.2
C. & I. M.	132	430	147	106	22	1,280	171	240	32	3,500	2,520	1,670	15.1	11.0	7.3
C. I. & L.	469	141	116	34	41	370	74	108	13	1,810	1,040	970	11.7	6.5	6.2
D. T. & I.	472	141	55	9	8	156	32	84	6	835	470	425	9.8	5.5	4.9
E. J. & E.	...	...	...	...	...	...	...	...	...	3,520	2,560	2,240	15.7	11.3	10.2
Penna.	10,975	128	191	159	73	1,180	78	46	236	3,840	2,680	2,580	12.3	8.5	8.1
W. Md.	891	220	137	137	18	615	61	122	14	2,470	1,780	1,380	17.8	12.8	10.0
Pocahontas Region:															
C. & O.	3,121	215	84	352	99	1,175	94	135	40	3,500	2,500	2,000	10.4	7.4	5.9
N. & W.	2,184	144	43	392	47	2,420	332	295	122	5,650	4,550	4,100	17.8	14.3	13.0
Southern Region:															
A. C. L.	5,144	145	31	20	14	215	26	75	9	1,340	810	752	18.1	11.0	10.2
C. of Ga.	1,940	55	53	47	11	325	34	53	12	1,150	735	650	18.5	11.6	10.6
Clinchfield	309	335	111	55	...	578	55	85	9	1,880	1,370	790	11.6	8.5	4.9
C. & G.	168	332	46	58	...	165	58	19	7	1,020	725	515	20.4	14.7	10.4
F. E. C.	839	238	91	39	14	238	26	21	9	1,390	720	547	17.5	9.0	6.9
Ga. & Fla.	465	143	21	5	...	65	7	16	2	4,920	2,900	202	23.5	14.0	9.7
G. M. & N.	845	150	12	44	4	135	24	32	5	750	480	380	15.1	9.7	7.6
I. C. Sys.	6,968	180	91	34	22	430	99	112	22	2,020	1,210	1,130	16.0	9.6	8.9
L. & N.	5,136	189	120	62	40	515	65	44	21	1,810	1,200	1,140	14.1	9.3	8.9
M. & O.	1,215	284	25	27	1	176	20	49	8	1,110	685	517	16.5	10.2	7.7
N. C. & St. L.	1,203	487	102	34	22	645	62	64	19	2,260	1,570	1,040	22.0	19.6	4.1
N. S.	932	265	22	11	5	117	17	9	12	725	480	295	15.4	10.3	6.3
R. F. & P.	117	...	...	...	...	...	...	...	...	995	590	...	34.2	20.3	...
S. A. L.	4,356	...	...	...	...	...	...	...	...	1,480	990	815	20.2	13.7	11.2
Southern	7,962	385	57	37	28	250	47	33	7	1,560	970	850	13.0	8.0	7.0
T. C.	287	511	67	42	2	215	68	52	6	1,250	950	650	18.7	14.1	9.6
Northwestern Region:															
C. & N. W.	...	...	...	...	...	...	...	...	...	1,390	860	820	16.0	9.9	9.4
C. G. W.	1,499	320	55	71	19	335	45	74	9	1,900	980	635	19.5	10.2	6.5
C. M. St. P. & P.	11,226	192	20	47	14	185	55	50	11	1,080	645	600	14.2	8.5	7.9
C. St. P. M. & O.	...	...	...	...	...	...	...	...	...	1,650	710	580	19.5	8.5	6.8
D. M. & N.	563	45	2	5	10	262	56	133	6	1,700	800	799	9.9	4.6	4.6
D. S. S. & A.	607	100	24	1	2	65	16	10	2	447	235	150	13.7	7.3	4.6
G. N.	8,452	87	36	17	20	157	15	19	10	1,000	480	435	13.7	6.6	6.0
L. S. & I.	160	156	20	5	3	172	8	30	10	1,040	475	415	9.0	4.0	3.5
M. & St. L.	1,627	162	26	13	...	89	39	19	3	750	396	304	15.8	8.4	6.5
M. St. P. & S. S. M.	4,304	191	29	40	4	134	21	28	4	850	465	324	16.8	9.2	6.4
N. P.	6,740	88	37	26	26	191	34	50	10	1,150	1,070	525	16.3	6.7	7.5
S. P. & S.	552	308	...	...	...	250	...	...	...	1,430	810	810	17.1	9.8	9.6
Central Western Region:															
A. T. & S. F.	13,535	95	43	35	22	276	50	59	11	1,270	715	580	14.6	8.1	6.5
B.-R. I.	275	36	36	2	1	69	18	21	2	245	212	212	7.1	6.1	6.1
C. B. & Q.	9,216	112	41	57	29	300	36	17	6	1,280	795	710	15.0	9.3	8.3
C. R. I. & P.	8,333	40	45	11	13	165	31	88	14	1,120	550	545	14.4	7.1	7.1
D. & R. G. W.	2,571	156	53	20	45	240	38	67	3	1,150	725	575	17.0	10.8	8.6
N. N.	165	106	5	7	4	51	27	19	5	550	285	190	32.3	17.1	11.4
Nw. P.	400	14	12	17	24	...	...	1	...	920	390	340	12.8	5.5	4.8
P. & P. U.	159	46	295	180	32	850	50	12	8	2,180	1,650	1,000	37.8	28.6	17.3
S. P. Sys.	9,053	115	19	32	40	...	3	...	...	1,390	725	655	12.9	6.7	6.1
U. P. Sys.	10,061	79	100	50	26	467	57	119	5	1,890	1,014	917	16.6	9.5	8.9
Utah	111	625	130	5	1	205	22	65	7	990	740	540	11.2	8.2	6.1
W. P.	...	...	...	...	...	...	...	...	...	1,570	930	760	17.5	10.4	8.5
Southwestern Region:															
K. C. S.	882	210	83	31	2	320	38	82	12	1,590	1,000	890	15.0	9.6	8.4
L. & A.	608	147	4	78	3	233	30	47	7	1,047	835	785	15.3	12.2	11.4
M-K-T	3,293	78	34	26	15	202	29	54	2	960	530	535	10.0	7.4	6.8
M. P. lines	10,314	...	96	144	9	...	36	...	...	1,670	1,200	1,020	20.4	15.0	12.7
St. L.-San F.	...	...	...	...	...	...	...	...	...	1,485	1,100	835	21.0	15.9	12.0
St. L. Sw.	1,894	63	22	15	4	124	27	42	4	570	382	382	8.3	5.6	5.5
T. & N. O.	4,505	...	29	28	20	...	...	...	...	710	475	425	11.1	7.5	6.7
T. & P.	1,950	190	58	38	14	296	78	78	17	1,330	1,000	920	12.8	9.7	9.0

* For further data on purchases, see *Railway Age*, March 10, 1934.
** Freight excluded.



Reported Expenditures of the Railroads for Fuel and Materials and Supplies for the Year, 1933, Compared to Their Gross Operating Revenues and to the Average Ratio of Purchases to Earnings in 1929—Railroads Grouped by Regions

region, 7.2 per cent of earnings and $670 per mile in the Central Western region, and 9.8 per cent of earnings and $765 per mile in the Southwestern region.

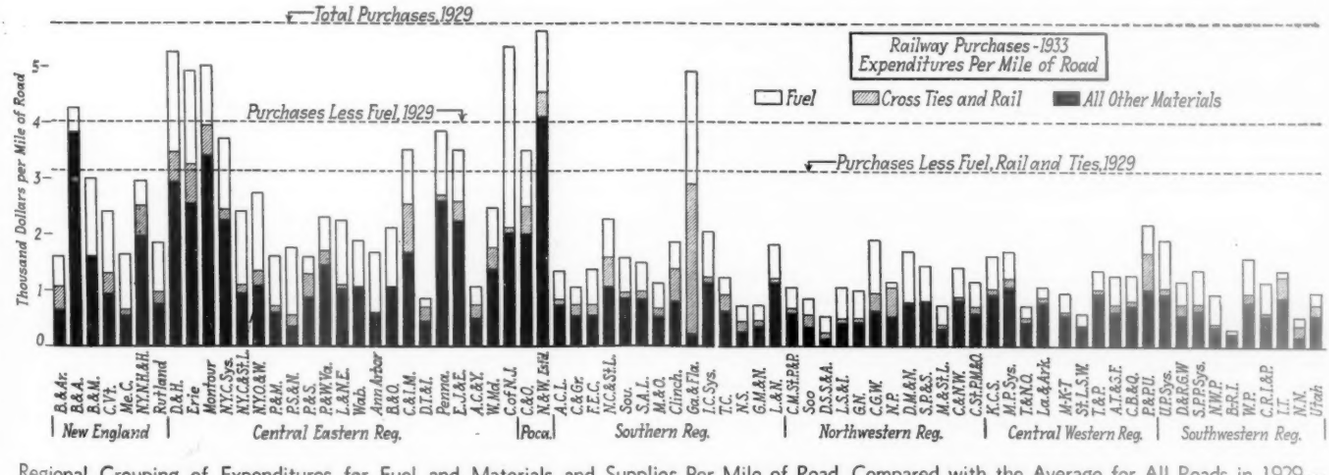
Considering iron and steel products alone, 3.58 per cent of earnings and $470 per mile for the United States as a whole, are contrasted with 7.7 per cent and $475 in the New England region, 4.25 per cent and $970 in the Great Lakes region, 3.20 per cent and $865 per mile in the Central Eastern region, 5.40 per cent and $1,800 per mile in the Pocahontas region, 2.95 per cent of earnings and $295 per mile in the Southern region, 2.45 per cent and $477 in the Northwestern region, 2.68 per cent and $250 in the Central Western region, and 2.60 per cent and $216 in the Southwestern region. Expenditures for forest products, in contrast with 1.32 per cent of earnings and $173 per mile of road for all regions, were, respectively, 3.02 per cent and $187 in the New England region, 1.23 per cent and $282 in the Great Lakes region, 0.45 per cent and $121 in the Central Eastern region, 0.56 per cent and $185 in the Pocahontas region, 2.14 per cent and $212 in the Southern region, 2.08 per cent and $150 in the Northwestern region, 1.01 per cent and $93 in the Central Western region, and 1.38 per cent and $117 per mile of road in the Southwestern region.

The figures are weighed averages, based on 7,110 miles of railroad in the New England region, 22,649 miles in the Great Lakes region, 20,305 miles of lines in the Central Eastern region, 5,300 miles of lines in the Pocahontas region, 37,569 miles in the Southern region, 45,873 miles in the Northwestern region, 54,404 miles in the Central Western region, and 23,444 miles in the Southwestern region. The highest percentage of earnings, these figures show, was spent for purchases, in the New England and Southwestern regions, and the lowest percentage in the Central Eastern region, while expenditures per mile of line were greatest in the Pocahontas region and least in the Northwestern region. This general relation was maintained in all major classes of expenditures, with the exception of forest products, where the largest expenditures per mile of line were made in the Great Lakes and the Southern regions.

Short Line Buying

"Do large roads buy more proportionately than small roads?" is a question regarding which opinion has been more plentiful than facts. The comparative purchases made in 1933 by the large roads and by the small roads are indicated by reports for two groups of railroads, one comprising nine large railway systems operating 92,771 miles of line, as follows: Atchison, Topeka & Santa Fe system, Southern Pacific system, Union Pacific system, Missouri Pacific lines, Southern system, Baltimore & Ohio system, Pennsylvania lines, New York Central system, and the Van Sweringen lines, while the second group contains 44 roads operating 25,733 miles of line, comprising all the roads of 1,500 miles of road, or less, for which statistics were available. While the purchases of the individual roads show variations, the total expenditures of the large roads for fuel and materials and supplies in 1933 were equivalent to 13.95 per cent of earnings and $2,200 per mile of road, and those of the smaller roads were equal to 16.40 per cent of earnings and $1,760 per mile of road, as compared with expenditures of 14.60 per cent of earnings and $1,910 per mile of road for all Class I roads. Exclusive of fuel, the purchases in the large group were equivalent to 8.54 per cent of earnings and $1,350 per mile of road, and those in the small group were 9.72 per cent of earnings and $1,045 per mile of road, in contrast with 8.9 per cent of earnings and $1,170 per mile for the United States. Excluding fuel, rail

(*Continued on page 477*)



Regional Grouping of Expenditures for Fuel and Materials and Supplies Per Mile of Road, Compared with the Average for All Roads in 1929—Note Variation in Expenditures as Compared with Percentage of Purchases to Earnings in Accompanying Chart

Would Cut Cost of L. C. L. Service

Co-ordinator's staff foresees huge savings—Consolidation of competing services suggested

ECONOMIES in railway merchandise transportation aggregating more than $100,000,000 a year apparently would be possible through integration of the railways' traffic, organizations, tariffs and operating methods, according to the merchandise traffic report of the Federal Co-ordinator of Transportation's Section of Transportation Service. This report was made public on March 22, and its basic recommendation as to the setting up of two new merchandise traffic handling organizations was reported in the *Railway Age* of March 24.

Studies made by the Section of Transportation Service indicated that the characteristics of the merchandise freight service of railway and highway carriers are in marked contrast in a number of ways, and that this fact is the reason for the diversion of much traffic from trains to trucks. Superiority of highway transportation over railway l.c.l. service was found with respect to speed, completeness of service, convenience, rates, tariff features and packing requirements. However, the report indicated a variety of changes in railway merchandise service which, if effected, would improve the position of the railways in competition for merchandise freight and tend toward the division of this traffic between railway and highway carriers on a more economic basis.

That part of the report dealing with potential economies in railway merchandise service is abstracted in the following:

Merchandise Traffic Has Not Paid Its Share

Rail l.c.l. traffic of the United States as a whole, in 1932, yielded an average revenue of $16.60 per ton originated. The average cost of handling this traffic, including only operating expenses and taxes, was at least $20.73, a ratio of 125 per cent. In the same year the revenue received from l.c.l. express traffic was $47.58 per ton, while for handling that traffic expenses and taxes of the express and rail companies aggregated $53.62 per ton, a ratio of 113 per cent. Therefore, in 1932, rail merchandise traffic failed to bear its full proportion of total operating expenses and taxes by $4.13 per rail l.c.l. ton and $6.04 per express ton, or about $80,000,000. In that year, out-of-pocket cost of performing l.c.l. freight service was at least $11.70 per ton, the out-of-pocket expense ratio, 70 per cent. The out-of-pocket cost of handling express traffic (including rail out-of-pocket costs and all expenses of the express company except rents) was $35.89 per ton, the out-of-pocket operating ratio, 75 per cent. The failure of rail merchandise traffic, as a whole, to pay its full share of transportation costs, is largely due to the expense incurred in maintaining redundant rail organizations, facilities and services, resulting in unnecessary duplication of station facilities, billing, platform handling, concentration and distribution, transfers en route and in a multiplicity of services and schedules.

Potential Economies in Administrative Expense

There are in the United States 151 separately operated Class I rail l.c.l. services, each with a complete executive, selling and accounting organization. Out of a total of 15,234,000 tons of rail merchandise, 7,815,000 tons or 51 per cent of the total, were each handled on the average by three distinct carriers, so that with respect to this "interline" traffic, the executive, selling and accounting effort was triplicated. In 1932 the out-of-pocket accounting expense of rail l.c.l. traffic was $17,730,000; other administrative expenses apportioned to that service amounted to $15,600,000.

The express traffic of the railways is pooled into two companies, one company carrier-owned, and the other company carrier-controlled. In 1932, these two organizations expended $10,727,000 for administration. This amounts to 9.8 cents per express shipment. In 1926, when the express waybills aggregated 195,000,000 (which is nearly 83 per cent of the total rail l.c.l., express and forwarder shipments in 1932), the cost per shipment was 7.71 cents.

Freight forwarding organizations result in further repetitions of administrative expense, particularly since the two largest forwarders are carrier-owned or carrier-controlled. In 1932, the administrative expense of forwarding companies, including selling and general office, amounted to $2,149,000.

If merchandise traffic now handled by rail were pooled, the several organizations integrated, and if the integrated organization could perform administrative duties at the same cost per shipment as did the express company in 1926, the total administrative expense of the three agencies on the basis of 1932 traffic would be reduced from $46,206,000 to $18,381,000, a reduction of $27,825,000. This is the maximum saving based on the assumption that rail administrative expense apportioned to l.c.l. service could be eliminated. The minimum saving indicated is $12,225,000, based on the contrary assumption that rail traffic and general expenses could not be reduced in any amount.

Potential Economies in Station Facilities

In 131 principal cities of the United States for which individual studies were made, there is an average of nearly seven freight depots per city. Within a radius of 35 miles of New York, there were in 1932 over 500 freight stations; in similar areas surrounding Philadelphia, 700; Chicago, 250; St. Louis, 200. In many cases, in addition to these depots, similar facilities are maintained for the express agencies and freight forwarders. Within a radius of 35 miles from the center of New York, there are 291 depots for the receipt and delivery of express and 241 offices where the express company loads and unloads express directly to and from trains. This duplication is largely due, directly or indirectly, to the provisions of the operating contracts relating to the distribution of the express traffic between the proprietary companies. Ordinarily freight depots are located in congested districts and on land of relatively high value. The rental value of the depots in the 131 principal cities referred to, based upon the Interstate Commerce Commission's appraisal of "cost of reproduction less depreciation" of the buildings, plus the "present value of the lands occupied," averages 78 cents per l.c.l. ton handled, and this, if applied to an average of four physical handlings for the entire United States, would amount to $3.12 per l.c.l. ton originated. The rents paid for depots by freight forwarders were 12 cents per ton originated; by motor operators, 26 cents per ton originated; by the express companies, $1.53 per ton originated. Integration of merchandise services would permit consolidation of these freight depots and release property, with resulting economies the extent of which would depend upon the ability of the carriers to dispose of the surplus facilities or to devote them to more profitable use.

Potential Economies in Rail Billing Expenses

In 1932, station clerical expenses averaged $4.16 per ton of rail l.c.l. freight originated. The clerical expense of freight forwarders was 75 cents per ton originated; highway common carriers' expense was 72 cents per ton originated; electric rail carrier clerical expense was 97 cents per ton; and the clerical expense of the express companies was $6.45 per ton originated. The excessive rail l.c.l. cost is due in part to the fact that the same accounting methods are used in billing l.c.l. and carload shipments, to shippers' order bills of lading, to meticulously detailed records necessary for the division of joint through rates and interline settlements, and to an intricate system of checking and rechecking employed in handling the shipments. The relatively larger express expense per ton originated was due to the larger number of shipments, since on the average there were 7.5 waybills per ton of l.c.l. freight originated and 38.8 waybills per ton of express. The rail l.c.l. station and clerical expense per shipment was 55 cents; express, 17 cents. Analysis of this express expense indicates that in a few cases, where a detailed apportionment of the revenue accruing to individual lines was not

required, the station clerical cost was only 10 cents per shipment. If merchandise traffic and organizations were integrated, and if the billing could be done at 10 cents per shipment, the cost per ton would be 75 cents (the same as for forwarder and highway common carriers) and the total rail station clerical cost on the basis of 1932 traffic would drop from $83,090,000 to $23,817,000, a reduction of $59,273,000 per annum.

Potential Economies in Rail Platform Expense

In 1932 the cost of platform labor handling rail l.c.l. traffic was 98 cents per ton physically handled, or a total of $1.96 for the origin and destination stations. The forwarder cost was 55 cents per ton physically handled, or a total of $1.10 for the origin and destination stations. The common carrier motor truck cost was 40 cents per ton physically handled, or 80 cents for the origin and destination stations. The foregoing rail costs are distributed costs for the United States as a whole. In 131 principal cities having 897 rail depots, the platform cost was 66 cents per ton handled. The rail express cost was $3.11 per ton originated, or $1.55 per physical handling. In 63 principal cities, electric rail carriers' platform cost was 52 cents per ton handled. Through integration of the traffic and facilities, the rail carriers should be enabled to handle merchandise for an average of 60 cents per ton at each origin and destination station, or $1.20 per ton for both. Thus, on the basis of 1932 traffic, platform expenses would be reduced from $40,661,000 to $23,953,000, a saving of $16,708,000 per annum.

Potential Economies by Reduction of Transfers

In 1932, on the average, each ton of l.c.l. freight originated was transferred from one car to another slightly more than once. Each such transfer cost in platform labor and supplies $1.95. There were interchanged 7,815,000 tons (51 per cent of the total traffic) an average of about twice each. In the interchange of through l.c.l. cars, no physical handling of the freight is involved, while in the interchange of freight in l.c.l. quantities physical handlings vary from a minimum of two to a maximum of four. The former interchanges constituted about 38 per cent of the total interchanges. At an intermediate transfer (without interchange) there is rarely more than one handling, but 62 per cent of the l.c.l. interchanges caused from one to three excess handlings. Pooling of the services by eliminating interchange should reduce physical handlings involved in the transfer of rail l.c.l. freight by at least 50 per cent. In addition, the labor costs of such handlings should be reduced to $1.20 per ton for the reasons explained in the preceding paragraph, and this would mean a reduction in total platform costs at intermediate transfers from $39,158,000 to $13,174,000, or a net reduction of $25,984,000, based on 1932 traffic.

Potential Economies in Concentration and Distribution of Merchandise

Much rail l.c.l. freight is concentrated and distributed by box cars. In 1932, in addition to way-freight train cars from which merchandise was distributed by train crews (which cars were generally unreported), 1,486,121 through (set out) cars were hauled for distances under 50 miles. The line haul cost of way freight trains is indicated to be 34 cents per loaded car-mile or more than three times the cost when in through freight trains, which is 9.8 cents per loaded car-mile. Since these through cars contained on the average only 2.7 tons each, the cost of distributing this tonnage by freight train approximated 12½ cents per ton-mile. In many cases the elimination of l.c.l. freight would reduce way freight train costs by making longer runs possible or by reducing or eliminating overtime work. In other cases, particularly on branch lines, the removal of the l.c.l. freight would not reduce the transportation cost. The comparable average road haul cost of handling this same freight by truck would be 3.3 cents per ton-mile. In many cases, a lower cost might be obtained by a combination of l.c.l., express and baggage into way freight trains or way express train cars, a practice now prohibited by the terms of the express contract. In 1932 there were 2,843,000 joint way peddler cars used in express service; 277,974 intra-terminal cars, containing an average load of 3.5 tons; and 345,611 trap cars, containing an average load of 5.4 tons, twitched in intra-terminal service. In many cases this freight could have been more economically and expeditiously handled by motor vehicles, and in other instances through the use of containers. The data now in hand are only sufficient to state that economies possible by integrated methods of concentration and distribution would be substantial.

The 1932 cost of collection and delivery of express is $23,649,000, which was at the rate of $8.37 per ton originated, or 22 cents per shipment. If this service were consolidated with the similar service for l.c.l., it probably could be handled at the same rate as the l.c.l. traffic—that is, $2.40 per ton—in view of the fact that the latter rate is nearly 50 per cent greater than the comparable truck collection and delivery cost. The cost of switching rail trap cars in 1932 is estimated at $2,516,000 (345,611 cars at $7.28 per car) which makes the aggregate amount paid for collection and delivery by rail agencies $26,165,000, in addition to which there was an unknown amount expended in 1932 for collection and delivery service by dray, which probably exceeded $2,000,000. Based on June, 1933, the cost of collection and delivery of freight forwarders in 1932 was approximately $3,480,000, bringing the total paid for the three classes of merchandise to $29,645,000. The cost of collection and delivery of the total merchandise traffic at $2.40 per ton would amount to $47,908,000, which means that the net increase in expenses occasioned by universal collection and delivery would be about $18,263,000 per annum on the basis of 1932 traffic, or less than $1 per ton of all merchandise.

Potential Economies by Reducing Multiple Services

Unnecessary duplications of rail service are caused by parallel rail express, freight forwarder and rail l.c.l. schedules. Substantially all forwarder and express schedules parallel l.c.l. schedules over the same routes, as well as many via competing routes. Differences in service which formerly distinguished rail express from rail l.c.l. traffic, including speed, complete service and higher charges, in many cases have been wiped out by the development of highway service.

The provisions of the express contract are directly responsible for unnecessary waste. The efforts of each rail carrier to participate in all possible l.c.l. movements multiplies parallel competing rail services three or four times. The result is operation of excess car miles and switching of excess cars.

The weighted average load of l.c.l. per car handled in 1932 was 3.63 tons; of express, 7.95 tons; and of forwarder traffic, 14.5 tons. To approximate the economies possible by integration of traffic, two detailed and complete re-routings of the 1932 movement of l.c.l. (in through or set-out cars) were made. Application of the forwarder or "key station" method of concentration and distribution indicated that an average load of approximately 15.5 tons per car for all merchandise traffic could be achieved. The express or "peddler" method indicated an average load of approximately 9.3 tons, which is about 20 per cent more than the express company's actual average in 1932.

From an examination of these analyses, it appears that a combination of the two methods should make possible an average load of 12 tons per car, in which case the costs of handling l.c.l. and forwarder freight, other than administration, switching, terminal and intermediate platform labor costs, apportioned upon a gross ton mile per loaded car basis, would be reduced from $138,700,000 to $76,970,000 per annum, and the full apportioned cost of handling merchandise in express service (assuming the same number of ton miles in that service as were actually handled in 1932) would fall from $81,340,000 to $55,204,000, a net reduction in both services of $87,866,000.

The reduction in out-of-pocket expense would be much less not only because of the elimination of all constant elements of cost but also because approximately 26 per cent of the car-miles used for l.c.l. loads would otherwise have moved empty. Application of the gross ton-mile per loaded car-mile out-of-pocket expense to 74 per cent of the tare weight of the indicated net reduction in freight-car miles would reduce the out-of-pocket expense by $27,000,000. Application of the out-of-pocket passenger car mile costs to the indicated reduction in express car miles indicates a further reduction in out-of-pocket expense of $10,000,000.

An average load of 12 tons per car would reduce the number of cars used in handling l.c.l. and forwarder traffic from 9,211,000 cars to 2,910,000 cars, and the express cars from 774,000 to 513,000. Resultant reductions in switching costs at intermediate transfer points, as well as at origin and destination, would be from $31,425,000 to $11,170,000, or $20,255,000.

Terminal Costs Compared

In 1932 the rail l.c.l. terminal cost was $7.28 per ton of l.c.l. freight originated. The highway common carrier terminal cost, including collection and delivery, was $2.62 per ton originated, a difference of $4.66 per ton in favor of highway operation. The 1932 rail l.c.l. cost other than terminal was 3.084 cents per ton mile, compared with the common carrier truck cost of 3.344 cents per ton mile—a difference in favor of the rail carrier of 2.60 mills per ton mile. It would require an average haul of about 1800 miles for the rail carriers' advantage in line haul cost to overcome the highway operators' terminal advantage.

from which it follows that as rail l.c.l. service was conducted in 1932 the highway service was the more economical for all hauls when the full apportioned costs, as revealed by the data examined, are accepted as criteria. The same condition is true of highway operations of private shippers for distance under 650 miles.

It must be borne in mind that the loss of the l.c.l. traffic now handled by rail carriers would not enable them to reduce their operating expenses in the same proportion as their revenues were thereby reduced, and that a complete loss of merchandise traffic would cause the rail carriers as a whole to lose in net income about $73,000,000.

By integration, economies in terminal operation are possible which would reduce the freight terminal cost from $7.82 per ton to $4.71 per ton (including universal collection and delivery) and the line and common costs from 3.084 cents per ton mile to 1.23 cents per ton mile in freight service. These potential costs compared with the 1932 highway costs would make it more economical to utilize rail service for l.c.l. transportation in excess of 100 miles. The costs of highway operation have been materially reduced within the past few years and further reductions appear to be possible which may tend to extend the economic sphere of that agency. However, on the other hand, the effect of the National Industrial Recovery Act in raising labor and material costs may offset these economies or indeed increase the highway costs and thereby extend the field of rail superiority. Assuming that the practices causing preventable wastes in the handling of railroad merchandise transportation are eliminated, then highway transportation for distances over 150 miles would not be economically justified with motor vehicles operated at the average cost of their 1932 operations; and likewise, concentration or distribution of merchandise in rail l.c.l. service for distances under 75 miles, even after the potential economies have been realized, generally will not be economically justified. Highway transportation for distances between 100 and 150 miles generally would be justified under the conditions assumed only when the superiority in speed or the flexibility of the vehicle was worth the additional cost of providing the service.

Three Proposals Advanced

The solution of the merchandise freight problem, in the judgment of the Section of Transportation Service, lies in (1) the consolidation of railway l.c.l., express and forwarder traffic and the pooling of all rail merchandise services into two competing merchandise services, owned by the railways but operated by independent managements; (2) the modernization of railway l.c.l. service, and (3) the modernization of merchandise freight tariffs.

Following is an abstract of the portion of the merchandise traffic report dealing with these recommendations:

This proposal (for consolidation and pooling) means the adoption for merchandise of the present express plan of pooling, by simply combining rail l.c.l., freight forwarder and rail express services. It provides for complete integration of all rail merchandise services and would eliminate much of the waste revealed. The plan, moreover, is safeguarded against several real objections from a carrier as well as a public standpoint which would apply against adoption of the present express arrangement without change. These objections are: (a) Protection of the public against virtual monopolies of merchandise transportation; (b) Wasteful methods of routing required by the present express contract; (c) Adequate protection of the revenues, gross and net, of the individual carriers participating in the pool.

If the traffic of all railroads were pooled into a single agency and the profits distributed upon the basis of the traffic contributed by each carrier to the pool, there would be no chance of prejudice to any individual carrier. However, with two competing pools set up, operating over different groups of rail carriers, prejudice to individual railroads might arise unless care be exercised in the composition of the pools. This is true because with two agencies, continental in scope, the expense of interchange would and should be avoided by limiting joint routes to movements between two local points each served by a different agency. The volume of traffic, therefore, which each agency would be likely to handle would be limited by the volume of merchandise originated by the carriers constituting the pool. In determining the composition of the pools the following are desiderata: (1) Grouping of the railroads into pools in such a manner that each railroad will share in the total net profits of all merchandise in a ratio equivalent to its share of the total merchandise revenues during a fair pre-contract test period; (2) A minimum disturbance in the present flow of merchandise traffic; (3) Pools or agencies of comparable financial and traffic originating strength and service capacity; and (4) Pools which conform as far as possible to the final consolidation plan of the Interstate Commerce Commission, so that if and when that plan should be consummated a reorganization of the pools will not be required on the one hand, and the pools will not interfere with the consummation of the plan upon the other.

Modernization of Service

Completeness is an essential element in transportation and collection and delivery service, and cannot and should not be restricted to a so-called trucking area. The economies in facilities, in station location, in physical handling methods, as well as in time, can be fully realized only when the service is for practical purposes universal. An "optional" system of collection and delivery requiring separation, flooring and warehousing of the merchandise, or a part of it, allowance or other forms of rebates, tends to destroy the benefits of the service, which should be operated as an integral part of the transportation service. At any point served by two or more competing agencies, collection and delivery service should be integrated into a single service operated jointly for the account of all merchandise carriers at that point.

The present complexity and expense of l.c.l. billing are due partly to the necessity for maintaining records for interline settlements, and partly to the practice of meticulously matching shipping papers and lading en route. The simplest form of billing is that of the parcel post service which, except in the case of insured or registered parcels, amounts to practically no billing at all. The billing to be used with integration of traffic can be further simplified by the adoption of a single bill system and the elimination of all checking, recording and listing en route, the ultimate goal being a system approaching in simplicity and economy that which is now used in handling parcel post.

Rail equipment for the handling of merchandise should be modernized. For the present the express and baggage car equipment is sufficiently shock-proof and capable of sufficient speed for merchandise service, although the excessive tare weight and deficiency in potential cubical capacity, dimensions considered, tend to make it obsolete. Temporarily, box cars can be made reasonably serviceable for transportation of merchandise by the installation of non-harmonic springs, and improved high-speed brakes and wheels. As the present equipment, express and freight, wears out, it should be replaced with light shock-proof equipment primarily designed for merchandise service. This equipment should include containers, truck bodies and other units interchangeable between the chassis of rail and highway vehicles.

The rail transportation of merchandise, exclusive of the incidental concentration and distribution services, should be limited to movement between concentration points in carload quantities. Merchandise should be delivered over night for at least all distances under 350 miles, by the second morning for distances within 900 miles, third morning within 1500 miles, fourth morning within 2100 miles, fifth morning within 2700 miles, and sixth morning within 3300 miles. These schedules, of course, are subject to such modification in different territories as conditions justify. The bulk of the merchandise can be moved upon freight trains within the requirements of these schedules.

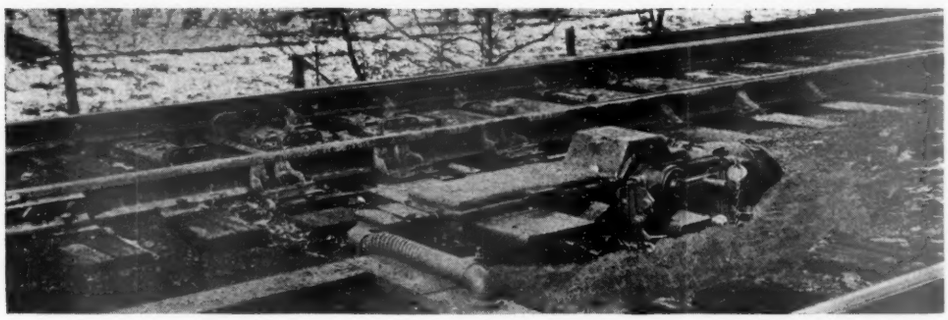
Merchandise requiring expedited service (over 35 miles per hour) should be handled on limited passenger trains between points where such trains operate, which would enable second morning delivery within 1500 miles, third morning delivery within 2500 miles, and fourth morning delivery within 3400 miles. The fastest express time now made between the Atlantic and the Pacific Coasts is fourth morning. The expedited service should be differentiated from ordinary service by the actual speed attained, rather than by the type of train upon which the goods are transported.

Modernization of Tariffs

Present conditions of disservice in the field of merchandise transportation cannot be corrected without a radical revision of the system of charges, out of which such conditions have arisen. The revision should have three clearly defined objectives: first, to make tariffs simple and intelligible to anyone, however unfamiliar he may be with the subject; second, to eliminate all provisions which unnecessarily add to the shipper's cost in preparing his goods for transportation; and third, to provide a system of charges which, while returning to the carrier its full cost and fair profit, will make it unprofitable for anyone to traffic in carrier rates and for one carrier agency to engage in transportation which can be more economically performed by another.

The express classification is a classification of exceptions. All articles are given a single merchandise rating regardless of value, except a relatively few articles. In addition, a few specifically named light, bulky or fragile articles are rated in multiples of

(Continued on page 476)



Dual-Control Switch Machines Are Used

C. T. C. Installed on the B. & O.

Interlocking and block office at the two ends of double track are replaced—Train movements facilitated

THE Baltimore & Ohio has installed centralized traffic control on 3.7 miles of single track on the Wheeling division between Fairpoint, Ohio, and Maynard. This division comprises a succession of single and double track sections, second tracking between Maynard and Fairpoint having been postponed on account of the large expenditure required, since this section traverses a very rough territory and includes numerous curves and one tunnel 475 ft. long. Passenger traffic is limited to one train each way daily. A large percentage of the freight handled is coal moving from West Virginia and southern Ohio northward to ports on Lake Erie and westward to Chicago and beyond. The number of trains varies, depending on the coal traffic, from 12 to as many as 40 daily. As helper engines are required for northbound tonnage trains, the return of the light engines increases the number of southbound movements.

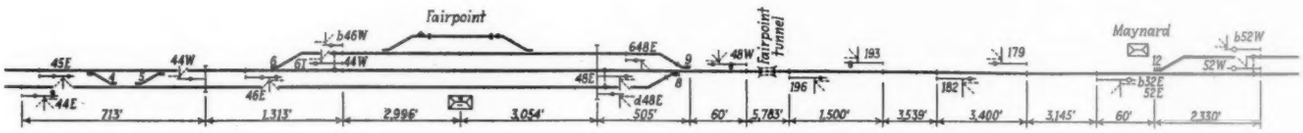
Old Layout Included Interlocking

Under the previous arrangement, this section of single track was operated as a manual block. An office was maintained at Maynard for all three tricks to operate the end-of-double-track switch and handle train orders. An 18-lever electric interlocking at Fairpoint included the end-of-double-track switch, certain crossovers and the siding switches. As there are several coal mines in this territory, a mine-run train is operated out of Fairpoint, requiring considerable switching at that point, which formerly blocked the old passing siding for extended periods.

In order to permit run-around movements on the double track just north of Fairpoint, it was desirable to provide two crossovers about a mile north of that station, and to extend the second track and the passing track 3,561 ft. south of the station. It was impracticable to reconstruct the old electric interlocking to adapt it to the extended track layout. Consideration was given, therefore, to the use of centralized traffic control, an especial advantage of using C.T.C. for the Fairpoint layout being that the new system could be arranged to include the end-of-double-track at Maynard, permitting the elimination of the block office at that point. A further advantage to be secured by C.T.C. was the improved safety of train operation and the increased capacity of the single track.

After having given consideration to all of these factors, it was decided to change the track layout at Fairpoint as previously explained, and to install C.T.C. between Maynard and the north crossovers at Fairpoint. the project to include A.P.B. automatic signaling on the single track.

The C.T.C. project includes eight high signals, four dwarf signals and eight power switch machines, located at the two ends of double track, at the two ends of the passing track and at the new crossovers. The automatic signaling includes four high signals between Maynard and Fairpoint, as well as two high distant signals at each end of the project.



Track and Signal Plan of C. T. C. Territory

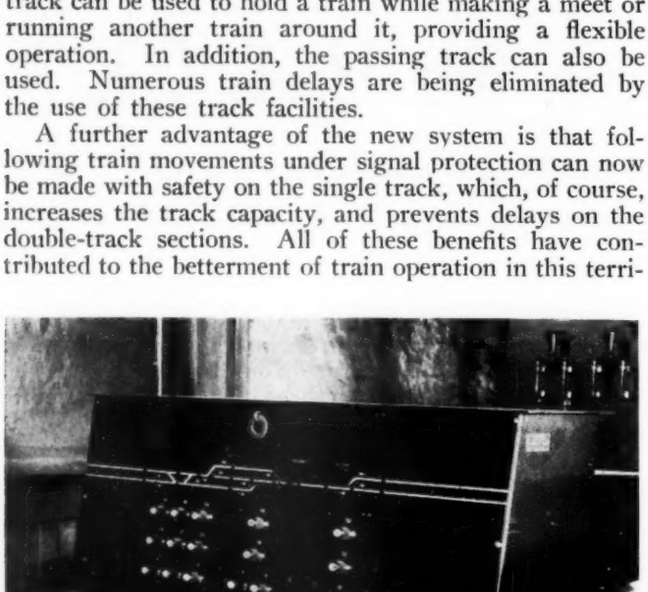
Arrangement of the C.T.C.

The C.T.C. control machine, located in the office at Fairpoint was furnished by the General Railway Signal Company and is constructed according to the standard design of that company. The panel, as shown in one of the illustrations, includes an illuminated track and signal plan, 6 switch levers, and 10 signal levers. Spare spaces are provided on the machine to permit the addition of levers in case it is desired to extend the C.T.C. installation in either direction. In view of the fact that the

majority of the power-operated switches and controlled signals were located in the vicinity of the control station, the "one-wire and common" system of control was utilized rather than the coded system.

In operation, the dispatcher at Wheeling communicates by telephone with the operator in charge of the C.T.C. machine at Fairpoint, informing him as to trains approaching the C.T.C. territory and giving directions as to the train movements to be made. Ordinarily northbound loaded trains are given preference. The crossovers north of Fairpoint are 8,582 ft. north of the end of double track, and the signaling is so arranged that train movements can be directed in either direction on both tracks in this area. By this arrangement either track can be used to hold a train while making a meet or running another train around it, providing a flexible operation. In addition, the passing track can also be used. Numerous train delays are being eliminated by the use of these track facilities.

A further advantage of the new system is that following train movements under signal protection can now be made with safety on the single track, which, of course, increases the track capacity, and prevents delays on the double-track sections. All of these benefits have contributed to the betterment of train operation in this territory and have been highly satisfactory to the operating department. The C.T.C. system has also made it possible to close the manual block office at Maynard, thus effecting a saving of about $6,000 annually.



The Control Machine Is in the Fairpoint Office

Detail of Equipment

The Baltimore & Ohio standard color-position-light signals are used throughout this installation. Each signal consists of a main unit with one or more markers. A red aspect without the marker illuminated means "stop and stay," while with a marker lighted it indicates "stop and proceed." Advantage is taken of this facility by making all intermediate signals indicate "stop and stay" against opposing moves and "stop and proceed" for following moves. For main routes, the marker is above the main unit, while for medium-speed routes the marker is below. A northward train entering the single-track section at Maynard—upon passing the head-block signal—sets that signal at "stop," and also causes energization of a direction relay. When the rear of the train has passed the end-of-double-track switch at Maynard, the dispatcher may send out a new control, which causes the display of a "stop and proceed" head-block signal, which will be accepted as such by a following train.

When desired, the main signal unit is equipped with a permissive aspect, displaying two lunar white lights in a row diagonally upward to the left. This indication is used to direct trains from the single track to the double track against the normal direction of traffic, signal 52E at Maynard and signal 48W at Fairpoint being so equipped. Signal 48W and signal 44E are equipped with a third marker, offset 40 in. to the left of the mast, which is lighted in conjunction with the clear aspect of the main unit to indicate the approach to a medium-speed signals.

Switch Machines

The switch machines on this installation are the Model-5D with the dual-control equipped for operation on 24 volts d-c. Standard approach, time, route and indication locking are provided for protection against the movement of switches when it is unsafe for a switch to be moved. The apparatus for the signaling, as well as for the centralized traffic control on this installation, was furnished by the General Railway Signal Company. The plans were developed in the office of the signal engineer of the Baltimore & Ohio, and the construction was handled by the Baltimore & Ohio signal construction forces under the direction of the signal engineer and under the supervision of the engineer maintenance of way.

Would Cut Cost of L. C. L. Service

(*Continued from page 474*)

the first class rate. This structure should be modified by classifying in the standard class all articles of merchandise (without naming them) except: (1) specifically named heavy articles grouped in the second class; and (2) specifically named very heavy articles grouped in the third class. This would mean one standard class and two limited classes or groups of exceptions. These three classes should be utilized to make any necessary differentiation in rates between territories.

The present packing requirements of the express agency should be liberalized so far as consistent with the principle that packing requirements should be only sufficient to withstand the ordinary and incidental shocks of transportation.

The present system of express rates should be applied to all merchandise, revised in the following particulars: The distance between express blocks should be measured in degrees of latitude and/or longitude instead of in miles. This will then make it possible to determine the rates between two points by computing the difference of their latitudes and longitudes, thereby eliminating the necessity for station directories, point to point rates, etc. The scale of rates should be based upon full operating cost and taxes, plus a fair profit for both line and terminal operations. The charges so designed should make unprofitable the handling of merchandise by highway for distances in excess of 150 miles, and the handling of merchandise by rail for distances under 75 miles. Special charges independent of the transportation rate structure should be made for custodian service, c.o.d. service, split deliveries, messenger service for the protection of valuable articles, and also for aggregation of small parcels into quantity lot shipments. The provisions of the express tariffs for released valuation should be reduced and made applicable to all merchandise traffic. The reduction in cost due to the elimination of this liability should be considered in fixing the basic scale. Tariffs for transportation of merchandise should contain in one document the classification, packing requirements and the specific rates for each degree of latitude and longitude, and should also show the latitude and longitude of all cities and towns.

Co-ordination

Rail and highway are naturally supplemental to rather than competitive with one another. The fields in which, from the standpoint of service and economy of operation, one is superior to the other, barely overlap. There is a large amount of traffic now moving by highway which can be moved more economically and serviceably by rail. Upon the other hand, there is an equally large amount of traffic which is moving by rail which can be more economically handled by highway. The two instrumentalities of transportation should be co-ordinated so that the shipping public is given the advantage of a system which utilizes to the

full extent the economies of each. This co-ordination may be brought about by contract, joint rates, lease or ownership. Through the co-ordination of their efforts, rail and highway operators should be able to make profitable operations which are today generally unprofitable.

Proper co-ordination of rail and highway facilities would make wholly unnecessary the duplication of freight and express depots which now exists. This is true with respect to the cities in which such depots are located, as well as the number of depots in such cities. Utilization of modern instruments of transportation would permit stations to be reduced to a limited number of concentration points at which merchandise is received and delivered. Such depots need no longer be located within expensive congested area, but can be placed at points most advantageous from a transportation standpoint.

A major problem involved in handling merchandise is to find the best and most economical way of assembling shipments from a large number of shippers in order to transport them in full carload quantities and then to distribute the consignments to a large number of receivers, again in relatively small quantities. Pooling of all rail merchandise would make available tonnage in sufficient volume to permit the daily operation of merchandise schedules throughout the United States, with the dependability and practically at the speed of the parcel post tonnage. A detailed car examination of 1932 l.c.l., express and forwarder traffic indicates that by the establishment of concentration centers merchandise can be aggregated and shipped in carloads averaging 12 tons per car. A number of methods are available. Generally it may be done through the utilization of the motor truck or tractor and trailer within the sphere of their economic utility; and in some cases by use of concentration or distribution cars upon local passenger, freight or mixed trains; and also by use of containers, truck bodies, trailers and other equipment interchangeable between rail and highway vehicles. No uniform practice can or should be laid down which would be universal or generally require the use of any one of these methods to the exclusion of the others. The test in each case should be the use of that instrumentality which performs the best service most economically.

Purchases Still Below Par

(*Continued from page 471*)

and ties, they were equivalent to 7.78 per cent of earnings and $1,230 per mile of road in the large group and 7.92 per cent and $855 per mile of road in the small group, as compared with 7.9 per cent and $1,040 per mile for the United States. The purchases of the large roads thus represented a smaller percentage of earnings and a larger expenditure per mile of road than the average for the United States, while purchases of the short roads represented a larger percentage of earnings and a smaller expenditure per mile of road.

Purchases and Receiverships

Further facts regarding railway purchases in 1933 were disclosed by the purchases of roads in receivership for which purchasing statistics were available. In this group were 16 roads, operating 40,100 miles of line, including the Florida East Coast, the Missouri Pacific lines, the Minneapolis & St. Louis, the Mobile & Ohio, the St. Louis-San Francisco, the Seaboard Air Line and the Wabash. Total purchases of fuel and materials and supplies of these roads in 1933 were equivalent to 17.70 per cent of their earnings and $1,410 per mile of line. Purchases, excluding fuel, were equivalent to 11.4 per cent of earnings and $900 per mile of road, and the purchases, excluding fuel, rail and ties, were 9.60 per cent of earnings and $760 per mile of road. The figures clearly show that the purchases made by these roads in 1933 in the aggregate took a larger proportion of earnings by a considerable amount than purchases of other classes of railroads, while the expenditures per mile of road were considerably less than the average for the United States and also the average outlay per mile of line by the roads of 1,500 miles or less.

New Books...

The Louisville & Nashville, An Outline History, by John Leeds Kerr. 67 pages, 9¼ in. by 6 in. Bound in cloth. Published by Young & Ottley, Inc., New York. Price $1.

Although the main purpose of this book is to present an outline history of one carrier, the Louisville & Nashville, Mr. Kerr's story is actually a vivid, non-technical account of the military value of steam railroads during the Civil War and the subsequent part which they played in the industrial reconstruction of the South.

The author believes that the confederacy might have won the war if the South's railroad gridiron of 1861 had comprised certain of today's traffic lanes. Developing his thesis under four main headings—"Railroads in the Ante-Bellum South," "The War of Secession," "Reconstruction" and "Expansion"—he traces in detail the colorful development of the Louisville & Nashville. James Guthrie was president of the road during the Civil War and Mr. Kerr pays a genuine tribute to Guthrie's leadership during this critical period. Especially does the author find, as he analyzes the unique earnings record of the Louisville & Nashville during and following the war, that Guthrie's neutrality proved to be a fortunate thing for the stockholders of the road.

Mr. Kerr is the author of other outline histories and apparently believes that brief, readable recitals meet with the greatest public appreciation. He recognizes that two or more volumes could be written on a corporation as prominent as the Louisville & Nashville, but he leaves this field for future academicians to present a chronology of corporate changes, personalities and other factual data.

Termites and Termite Control—Published by the University of California Press, Berkeley, Calif. 734 pages, 9 in. by 6 in. Bound in cloth. Price, $5.

This book, dealing with termites and methods for their control, is undoubtedly the most thorough accumulation of data on this subject that has yet been prepared. Published by the Termite Investigations Committee, formed in August, 1928, to investigate the conditions as they exist pertaining to termites, the action of these insects upon structures and the best means of protecting structures against their attack, the book takes the form of a report or series of individual reports. It contains data, ideas and conclusions which are the result of the co-operation of men prominent in the large-scale production and utilization of wood, and of scientific men, chiefly members of the faculty of the University of California, interested in specific phases of the subject.

In view of the reported increased activity of termites in certain sections of the country, Termites and Termite Control should be of distinct value to railway men, especially those whose responsibilities include the design and maintenance of structures, including bridges, buildings, pole lines, fences, etc. Termites and their destructive habits are faithfully described, and the questions of how to identify termite activity and effective means for the extermination and control of these insects are discussed thoroughly. In addition, the book devotes a separate chapter to wood-boring insects whose appearance or workings resemble those of termites.

While much of the book is of special interest to biologists and entomologists, even the technical discussions have been prepared largely in language that can be readily understood by engineers and men in the professions who have no detailed knowledge of biology and entomology, the thought being to make the book of maximum value to all users of forest products. Of special interest to railroad men are Part III, dealing with the termite resistivity of wood and other building materials, and Part IV, dealing with the prevention and repair of termite damage, which contains a separate chapter dealing specifically with railroad structures.

The book is particularly timely because of the widespread interest at the present time in the subject of termite control, especially throughout the southern two-thirds of the United States and along both the Atlantic and the Pacific seaboards. The entire proceeds from the sale of the book are to be used in extending the research work of the Termites Investigation committee.

NEWS

South Makes Best Showing in Passenger Revenue Gain

January gross up 8.5 per cent over 1933 — East also has revenue increase

A 0.7 per cent increase in passenger revenues in the eastern district and 0.6 and 11.68 per cent decreases in the southern and western districts during December, 1933, the first month in which reduced passenger rates were effective in the latter districts, as compared with December, 1932, are shown in the I.C.C. December statement of Revenue Traffic Statistics of Class I Steam Railways in the United States. In January, 1934, passenger revenues in eastern and southern districts increased, while in the western district they declined.

Passenger revenues in the eastern district increased from $17,834,740 in December, 1932, to $17,964,911 in December, 1933. In the southern district they decreased from $3,672,663 in December, 1932, to $3,670,553 in December, 1933. In the western district they decreased from $8,687,585 in December, 1932, to $7,673,409 in December, 1933. For the United States as a whole they decreased from $30,194,988 in December, 1932, to 29,308,873 in December, 1933.

Passenger revenues in the eastern district increased from $16,144,488 in January, 1933, to $16,781,893 in January, 1934. In the southern district they increased from $3,396,728 in January, 1933, to $3,686,139 in January, 1934. In the western district they decreased from $7,112,461 in January, 1933, to $6,731,703 in January, 1934. For the country as a whole they increased from $26,653,677 in January, 1933, to $27,199,735 in January, 1934.

While passenger revenues increased 0.7 per cent in the eastern district and decreased 0.6 and 11.68 per cent in the southern and western districts in December, 1933, as compared with December, 1932, the revenue passengers carried decreased 0.7 per cent in the eastern district and increased 27.2 and 5.51 per cent in the southern and western districts. The revenue passengers carried in the eastern district totaled 28,079,000 in December, 1933, and 28,289,000 in December, 1932. In the southern district they totaled 3,850,000 in December, 1933, and 3,026,000 in December, 1932. In the western district they totaled 6,759,000 in December, 1933, and 6,406,000 in December, 1932.

At the same time the revenue passengers carried one mile increased 7.48 per cent in the eastern district and 37.27 per cent in the southern district but declined 0.69 per cent in the western district in December, 1933, as compared with December, 1932. In the eastern district the revenue passengers carried one mile totaled 845,295,000 in December, 1933, and 786,420,000 in December, 1932. In the southern district they totaled 202,436,000 in December, 1933, and 147,470,000 in December, 1932. In the western district they totaled 443,494,000 in December, 1933, and 446,580,000 in December, 1932.

The revenue per passenger-mile showed a decreased in all districts. In the eastern district it dropped from 2.268 in December, 1932, to 2.125 in December, 1933, although the basic rate remained at 3.6 cents. In the southern district, where the basic rate was lowered to 1½ cents on some roads, it amounted to 1.813 in December, 1933, and 2.490 in December, 1932. In the western district, where all roads adopted the 2-cent rate, it amounted to 1.730 cents in December, 1933, and 1.945 cents in December, 1932.

N. & W. Efficiency Meetings

Approximately 210 local efficiency meetings will be held by Norfolk & Western employees during the next ten months, according to a schedule published in the March issue of the Norfolk & Western Magazine. The meetings will take place at 22 places along the line of the N. & W.

I. C. Establishes Fast Freight Train

The Illinois Central, on March 22, established a 41-hr. freight schedule between Chicago and New Orleans, La., the new train being the fastest in its freight service with the exception of its banana trains. The train leaves Chicago at 11 a.m. and saves about 24 hr. time on shipments that miss the 1:35 a.m. train.

Silk Rates Reduced

In a further effort to compete with the Panama canal, transcontinental railroads have reduced the freight rate on raw silk from the Pacific Coast to New York from $6 to $4 per 100 lb., thus making the ocean-rail rate $7, as compared with an all-water rate of $6. In December, 1931, the rail rate was reduced from $9 to $6.

C. N. R. to Re-open Minaki

Minaki Lodge, summer resort of the Canadian National in the northern section of the Lake of the Woods district of Ontario, will be opened again this summer. During the height of the depression last year this hotel was kept closed by the company but general business conditions and travel prospects have improved to such an extent that the company feels justified in reopening Minaki again this summer. The dates will be June 29 to September 3, inclusive.

Railroad Labor Insists on Restoration of Pay

Problem again referred to Eastman after President's conferences with both sides

The problem of bringing about a settlement between the railroads and the 21 organizations representing their employees on a basis of wages to prevail on the expiration of the present 10 per cent deduction agreement on June 30 was again referred to Joseph B. Eastman, federal co-ordinator of transportation, after conferences with President Roosevelt on Tuesday, March 27, after five successive days of mediation on his part with the Conference Committee of Managers and the Railway Labor Executives' Association had failed to produce results.

Although the management committee had expressed a willingness to conform to the program set forth in the President's letter of March 20, in which he had suggested a postponement of the wage issue with an adjustment of pay for the employees who are receiving the lowest rates of pay, below minimums established in the N. R. A. codes, the labor committee had persistently declined to withdraw its demand for a readjustment of the basic rates on July 1. It had also declined to agree to the proposal suggested by the President and communicated to the committee by Mr. Eastman, for a six-months continuation of the present arrangement, a readjustment for the lower-paid men, and the appointment of a special commission to decide as to the basis after January 1 upon a consideration of railroad earnings and carloadings. It is understood that the proposal was that the basic rates be restored when carloadings return to the 1931 level, but the labor organizations objected to the idea that their wages should be made dependent upon the earnings of the companies, and insisted that the time has come to restore "fair" wage rates.

After both sides had agreed to accept his services, on March 21, Mr. Eastman began conferences with the two committees on the following day, meeting with the railroad committee in the morning at one hotel and with the labor committee in the afternoon at another. This process was repeated the next day but thereafter most of the conferences were held with the labor group. On Sunday Mr. Eastman also conferred with the President twice on the matter and on Monday morning he again put the President's views before them, indicating that if they failed to accept it would be necessary to refer the entire matter to the orderly processes provided by

(*Continued on page 482*)

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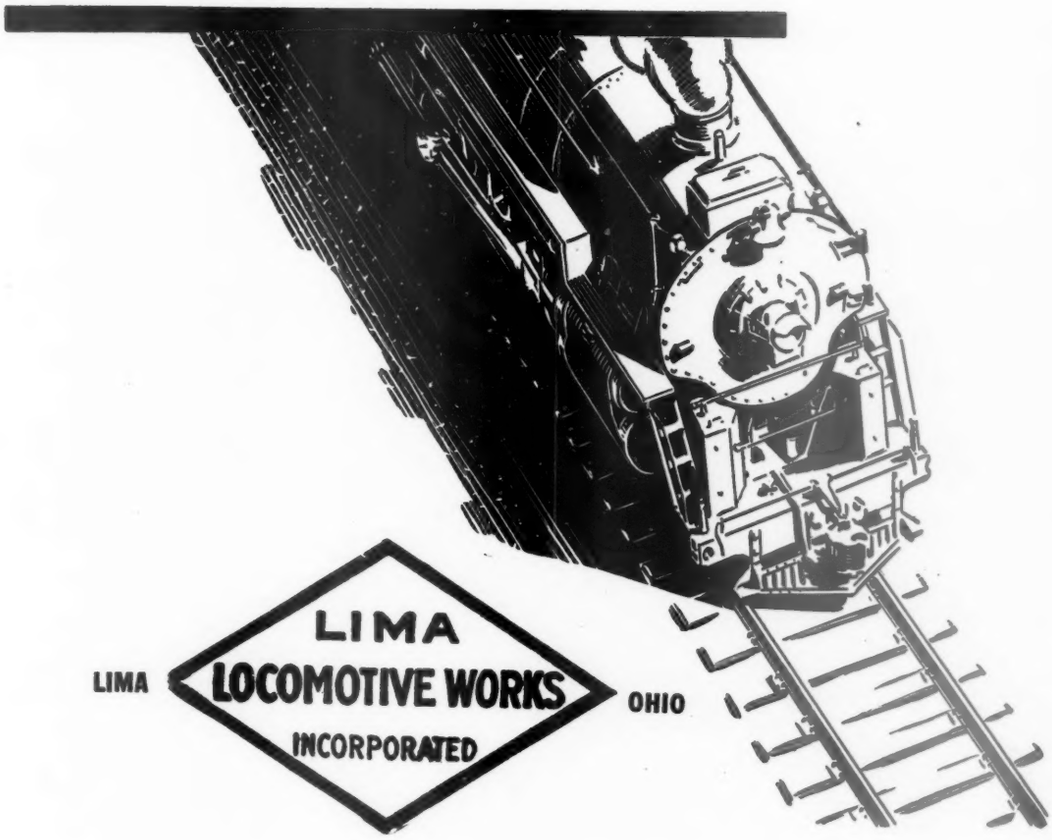
NEW POWER IS NEEDED

The railroads which bind this country into one great economic unit are still the best means of providing low cost transportation. ● But if they are to maintain their competitive advantage they need modern motive power to speed operation and reduce costs.



LIMA LOCOMOTIVE WORKS INCORPORATED LIMA OHIO

Beatty Elucidates C. P. R. Loan Pledge by Cabinet

Canadian banks required security for advances needed to meet current maturities

President E. W. Beatty, of the Canadian Pacific, appearing at Ottawa last week before the House Committee on Banking and Commerce which is probing, among other things, the Canadian Government's guarantee to the Canadian banks of their $60,000,000 five-year loan to the Canadian Pacific Railway at 5 per cent, stated that he regarded the loan a good one without the Government guarantee. Jackson Dodds, general manager of the Bank of Montreal, which has been the C. P. R. bank since it began operations, admitted the loan was a good one after the federal government gave its backing. Premier R. B. Bennett, the third witness called before the committee, because it was his Cabinet which provided the guarantee, declared he deemed it the proper thing to do and would do it again. He thought it was in the interest of the whole Dominion. Liberals (the opposition party) in the House and in the committee have contended they were not opposed to giving financial aid to the C. P. R. but they protested against the manner in which it was done by the Government. Hon. J. L. Ralston, a former Liberal cabinet minister, quizzed Premier Bennett in the banking committee and made it clear the Liberals objected to the Government committing the taxpayers to a guarantee of a $60,000,000 loan to a private corporation without first consulting Parliament, and Col. Ralston stressed the point that the order-in-council approved by the Cabinet giving the guarantee was passed last November, while the final conversation between Premier Bennett and Mr. Beatty about the loan was last May when Parliament was in session. Premier Bennett explained that he gave the guarantee under the emergency relief powers given the Government by Parliament in 1931.

Mr. Beatty, during his evidence before the House committee this week, read a statement showing the need and the purpose of the loan which read in part as follows:

Prior to 1931 the Company procured money for capital purposes by the sale to the public of capital stock, debenture stock, collateral trust bonds and other long term securities. The practice was to pay for extensions, additions and improvements out of current cash, and on completion of the work to reimburse the treasury to the extent considered expedient by a public issue of securities.

In that year the depression began to be felt, the surplus earnings of the year falling to $14,584,471 from $39,131,716 in 1930 and $42,227,761 in 1929. Its commitments for extensions and improvements during the year were heavy, and, being unable, on account of the unfavorable condition of the security market, to provide for them in the usual way, the company obtained from the Bank of Montreal two advances for a period of two years, one of $5,000,000 and the other of $15,000,000.

The situation in May, 1933, was that these obligations were maturing on June 22 and September 30; a loan of $10,000,000 from the Chase National Bank of New York was to mature on July 15, and loans from various other United States banks aggregating $2,300,000 later in the year. To provide for these and for the principal of long term securities held by the public, maturing in 1933 and 1934, the company applied to a group of Canadian banks for a loan of $60,000,000, to be secured by the pledge of $100,000,000 consolidated debenture stock, for a term of five years, it being considered that at the expiration of that period, or sooner, the security market would have improved to such an extent that the loan could be retired by the sale of the consolidated debenture stock in the market.

The market price in New York of consolidated debenture stock ranged at that time from 58 to 67. Since that time the market has steadily improved, and is now 80 and upwards, at which price the value of the security for the loan of $60,000,000 is now approximately $80,000,000. Owing, however, to the large amount involved, the period for which it was desired, and the unsteady condition of the market, the banks required additional security, and the company thereupon undertook to apply to the Dominion Government for a guarantee.

After some preliminary conversations the matter was formally laid before the Prime Minister on May 30 by the president of the Bank of Montreal and myself, at which time I submitted to him a confidential memo to which I will presently refer. At these interviews the requirements of the company, the nature of the security and conditions in financial centers were discussed at length. It being suggested by the Prime Minister that, notwithstanding our advices from London, it was possible that some part at least of the loan might be obtained there, I undertook to personally canvass the situation from that point of view, and to the extent of my success to reduce the amount of the bank loans.

On May 31 the Rt. Hon. Mr. Bennett notified the banks of the Government's approval. Owing to his immediate departure for England the requisite order-in-council stood over until his return, but the banks agreed to make the advances on the assurance of the notice given them. The terms of the loan provided for its being advanced in two instalments, one of $35,000,000 on June 22, 1933, and the other of $25,000,000 on December 1, 1933, with the privilege to the company of paying at any time before maturity, ratably among the banks, the whole or any part of the principal, on giving not less than sixty days' notice in writing.

Freight Claims Settled in 90 Days

Of the claims filed by shippers with the railways in the last calendar year, 92.5 per cent were settled within 90 days. A total of 1,514,986 claims were received from claimants during the year, in addition to 52,976 which were reopened and 133,929 that were unsettled at the close of the previous year. Of the 1,701,891 claims handled, 1,379,391 were paid, 157,315 were declined and withdrawn, and 165,185 were unsettled at the close of the year.

Proposed Cut in Refrigerator Car Mileage Found Unjustified

The Interstate Commerce Commission has found unjustified a proposal by certain railroads to reduce from 2 cents to 1 cent the mileage rate to be paid to the North American Car Corporation for 50 mechanical refrigerator cars known as "Frigicars." The roads had proposed the reduced rate to compensate for the added costs in hauling the refrigerating apparatus and furnishing power from the car axle.

Expect Illinois Railroads to Co-operate in Crossing Elimination

The Illinois Commerce Commission, on March 22, ordered all principal railroads in that state to appear before it and show cause why a program for the elimination and improvement of grade crossings should not be inaugurated. According to Benjamin F. Lindheimer, chairman, it is not the commission's plan to promote the building of subways, such improvements being cared for by the state highway department, which is preparing to carry out 60 projects in 1934. The commission will demand protective devices, ranging from flashing light signals, bells and automatic gates to the conventional type of cross bar warning sign. Hearings on the citations will begin April 4 and will continue to April 12.

R. V. Fletcher Analyzes Reports of Co-ordinator

A. R. E. general counsel includes some comment on Eastman's discussion of government ownership

Two reports issued by Co-ordinator Eastman, dated January 20 and March 10, "dealing as they do with some of the fundamentals of the transportation problem and emanating from an official source so able and so well informed, constitute a distinctive landmark along the course of our political and economic history," said R. V. Fletcher, general counsel of the Association of Railway Executives, in an address before the Allegheny Regional Advisory Board at Pittsburgh, Pa., on March 15. Judge Fletcher's address included point-by-point explanations of and comments on various questions discussed by Mr. Eastman in the two documents. Of the co-ordinator's discussion of government ownership Judge Fletcher said in part:

"The co-ordinator devotes many pages of his arresting report to a defense of his well known views on the subject of government ownership and operation. I venture, with great deference, to suggest that an impartial reader of the document will find this portion the least satisfactory part of the report. In the first place, the discussion is essentially academic since Mr. Eastman wisely concludes that whatever may be the theoretical value of public ownership, neither the present state of public sentiment nor the condition of government finances would, at this time, justify a recommendation that an attempt be made to make it presently effective. In the light of this conclusion, the discussion of the abstract merits of the subject would seem to have little place in a report to Congress, the purpose of which is to aid in needed legislation. In the second place, the co-ordinator's treatment of the much discussed question, while it has served to attract fresh attention to the subject, and as one important newspaper has editorially stated, has lifted the discussion from the level of the soap box to that of the lecture platform, is noticeably deficient in persuasive affirmative arguments in its favor. The discussion in the report, while in no sense apologetic in tone, abounds in what the lawyers refer to as pleas in confession and avoidance, dealing with experiments in government control in the Western Hemisphere which have not favorably impressed the public. This is hardly the time and place to enter into a careful examination of the question, which we recognize, however, as interesting and important. Mr. Eastman does recognize with commendable candor that the operation of the railroads under government control, if successful, must be divorced from political influences; that at best it would present grave problems in administration, that the public would have to become reconciled to the elimination of competition, and that very probably the adoption of such a policy would involve the necessity of the government taking over not only the railroads but motor, water and air lines as well."

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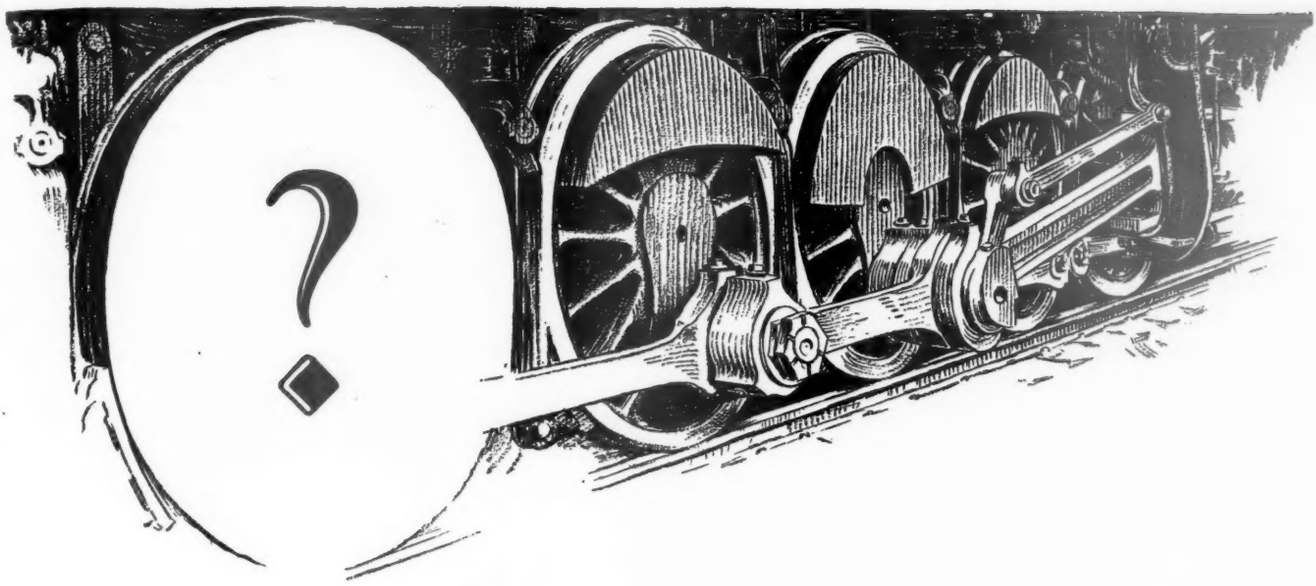


Why haul around an *Extra* pair of drivers

Only two ways exist for obtaining the extra power needed to set in motion the train that can then be hauled at speed.

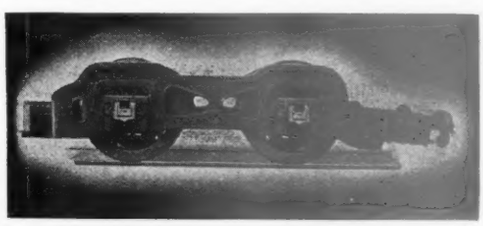
If an extra pair of drivers is added for this purpose, locomotive cost, operation and maintenance expense are needlessly increased.

When The Locomotive Booster is used, the added power is available when needed, but is inoperative when it has done its job of bringing the train to road speed.

The Booster is concentrated power; economical power—equivalent to that of an extra pair of drivers.

It is the most economical way of obtaining tractive power. Without it, far greater weight must be built into the locomotive, to be hauled around constantly in order to supply power that is needed only in starting and at slow speeds.

Half a cent per locomotive mile covers Booster maintenance. Compare this with the cost of added power obtained simply by adding weight to the locomotive.



For existing locomotives, consider The Booster as a package of tractive power that may be quickly and inexpensively added—even in the roundhouse, instead of awaiting a shopping period. ■

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

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Pacific Northwest Advisory Board

An increase of 16.6 per cent in carloadings in the Pacific Northwest for the second quarter of the year over the actual carloadings in the corresponding period last year was forecast at a meeting of the Pacific Northwest Advisory Board on March 24. Of the 32 classifications reported on, only 6 are expected to show decreases. Estimates indicate that the remainder will show increases ranging from 0.5 per cent on furniture to 64.1 per cent on cement and concrete products.

Salary Reductions

Reductions in the salaries of railroad officers required by the Reconstruction Finance Corporation as a condition for the granting of loans, under the amendment to the R. F. C. act passed by Congress last year, have amounted to $606,000, according to Chairman Jones of the corporation. No fixed rule was considered in requiring the reductions, but of a total of 65 roads that obtained loans from the corporation all but about 20 were required to make readjustments.

Atlantic States Shippers' Board

The Atlantic States Shippers' Advisory Board will hold its next meeting at Lord Baltimore Hotel, Baltimore, Md., on Thursday, April 5. Among the items on the docket are a discussion on Section 4 of the Interstate Commerce Commission law, (the long and short haul section) and an open forum on the recommendation of the Federal co-ordinator, J. B. Eastman, that the Interstate Commerce Commission be clothed with authority to regulate transportation on waterways and highways.

Permission to Intervene in Missouri Pacific Bankruptcy Denied

The application of the Irving Trust Company of New York for permission to intervene generally in the Missouri Pacific bankruptcy proceedings has been denied by U. S. District Judge C. B. Faris. The court held, however, that the trust company might intervene for any purpose specifically affecting the holders of the mortgage bonds of the New Orleans, Texas & Mexico for which it is trustee under the mortgage. In rejecting the request to intervene generally, Judge Faris said that the recent amendment to the federal bankruptcy laws was clearly meant to limit the right of intervention and to give broad discretionary powers to the courts.

Brotherhood Objects to Oil-Electric Locomotives

In its recent report approving the proposed expenditure by the Delaware, Lackawanna & Western of $4,666,000 to be loaned by the Public Works Administration for the purchase and reconstruction of equipment the Interstate Commerce Commission stated that a protest had been received from a vice-president of the Brotherhood of Locomotive Firemen and Enginemen against "approval of a loan" for the purchase of five oil-electric locomotives on the ground that the company's steam locomotives were adequate for its service and that the installation of the oil-electric locomotives would result in the furlough of firemen and engineers. The commission stated, however, that this raised a question bearing on the propriety of making the loan, which was not for its determination, and that its function was only to determine the desirability of the change in motive power as an improvement of transportation facilities.

Georgia Orders Permanent Fare Reduction

The Georgia Public Service Commission has issued an order reducing coach and Pullman rates in that state to a permanent basis of two cents a mile. The order is the result of a study of the effect of the 1½-cent coach and 2, 2½ and 3-cent Pullman rates placed in effect by Southern lines in December last, which shows that the experimental low fares have increased passenger business materially and in some cases over 100 per cent. The commission's data on the business done by major Southern lines since December 1, show a progressive increase not only in the volume of traffic but in gross revenue, over the same months a year ago. Every railroad has had an increase in the number of passengers carried each month since December 1.

D. & H. Labor Dispute Settled

The dispute between the Delaware & Hudson and the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen & Enginemen and the Brotherhood of Railroad Trainmen, over the company's proposal to continue in effect its payment of employees who are members of these organizations on a basis of hours (with a guaranteed monthly minimum) instead of on a basis of mileage-or-hours, was amicably settled on March 23 under the mediation of the President's fact-finding committee. The company agreed to restore the mileage-or-hours wage basis and the organizations agreed not to pursue further a number of alleged grievances against the company. The Order of Railway Conductors was not a party to the dispute on the wage basis since its contract for guaranteed payment by hours has not expired. The management has, however, in the interest of uniformity, offered to restore the mileage-and-hours basis for these employees also.

Report on Pittsburgh Derailment

John P. Dohoney, chief of the Accident division of the Pennsylvania Public Service Commission, has issued his report on the derailment on the Pennsylvania, at Pittsburgh, Pa., on February 26, when eight passengers and two employees, engineman and fireman, were killed and 40 persons were injured. He finds that the cause was excessive speed on a sharp curve, and recommends that the road investigate the economic feasibility of extending its cab signal system into that territory. As a possible alternative, he mentions "automatic speed control." The train had passed two approach signals set against it. On the train were a trainmaster, two qualified enginemen and four qualified conductors, yet no one took sufficient notice of the excessive speed to take any action toward signaling to the engineman or applying the brakes. The trainmaster, who was severely injured in the accident, asserted that he pulled the air-whistle cord, but in view of the testimony of other occupants of the car, the investigator holds that the trainmaster is mistaken in his belief that he pulled the cord.

Airlines Carry 568,940 Passengers in 1933

American-operated airlines (domestic and foreign extensions) carried 568,940 passengers during the calendar year 1933, an increase of about 28,000 over the previous year, according to an announcement by the Aeronautics Branch, Department of Commerce. Air express also increased appreciably during 1933, while air mail was slightly less than in 1932. Of the total number of passengers carried in 1933, there were 493,141 who traveled on the domestic airlines and 75,799 who flew on foreign extensions to Latin America and Canada. Air express amounted to 2,452,812 pounds in 1933, as compared with 1,600,821 in 1932. The 1933 total included 1,510,215 pounds carried on domestic lines and 942,597 pounds on foreign extensions. Air mail carried on domestic and foreign routes by American operators totaled 7,816,532 pounds in 1933 as against 7,908,723 pounds in the previous year. Mail carried in 1933 was divided as follows: Domestic, 7,362,180 pounds; foreign extensions, 454,352 pounds. Miles flown by all scheduled operators in 1933 were 54,642,545 as compared with 50,932,967 flown in 1932. Passenger miles flown in 1933 were 198,800,079 and for 1932 this figure was 146,552,587. A passenger mile is the equivalent of 1 passenger flown 1 mile.

Temporary Pooling for Express Refrigerator Cars

The federal co-ordinator of transportation in conjunction with the Railway Express Agency, Inc., is undertaking to bring about more economical and efficient operation of express refrigerator cars, the control of which has heretofore been exercised largely by the railroads on whose lines the products requiring express movement under refrigeration originate. Through a temporary agreement between the Express Agency and the interested railroads, the handling of these cars will be pooled during the heavy Spring movement, and a study will be made to determine the desirability of forming a permanent pool.

A committee of railroad officers has been named to work with the Railway Express Agency under the chairmanship of L. O. Head, president of the agency. The railroad members of the committee are: J. R. Koontz, chief traffic officer, St. Louis-San Francisco; R. L. Kleine, assistant chief of motive power, Pennsylvania; S. O. Taylor, master car builder, Missouri Pacific Lines; G. C. Christy, superintendent car department, Illinois Central System; H. R. Lake, general superintendent of transportation, Atchison, Topeka & Santa Fe; J. C. Wroton, general superintendent of transportation, Seaboard Air Line; J. C. McCahan, manager mail and express traffic, Baltimore & Ohio; A. R. Smith, vice-president, Louisville &

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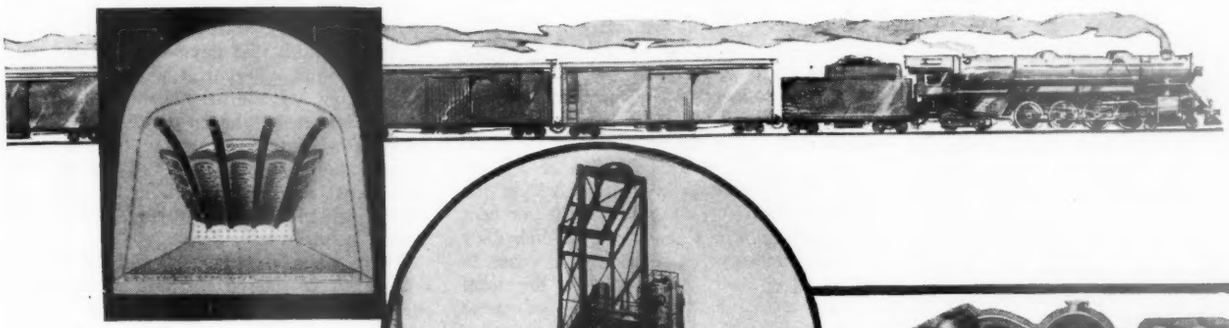
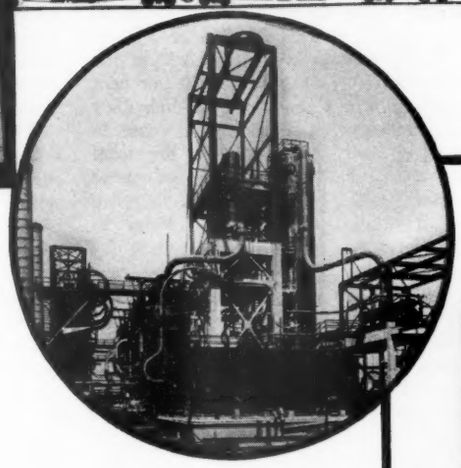
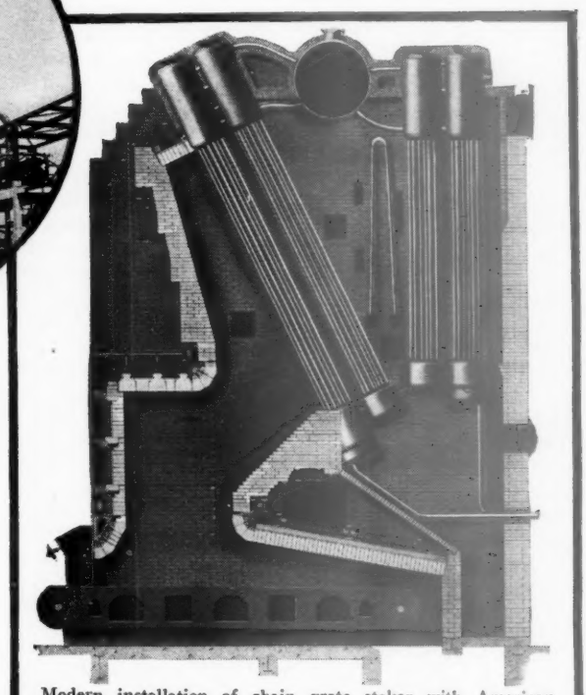
Not only ON LOCOMOTIVES







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Nashville; C. F. Smith, manager passenger transportation, New York Central Lines; J. T. H. Armstrong, assistant general manager, Pacific Fruit Express Company.

Transportation Committee to Study Pooling

The federal co-ordinator of transportation on March 27 announce the appointment of a special committee of railroad transportation officers who will cooperate with his organization in its study of freight car pooling. The committee will have the benefit of a maintenance program which has been submitted to the co-ordinator by the special mechanical-accounting committee which has been working for several weeks on the mechanical features of the pool.

The personnel of the transportation committee is as follows: J. L. Brown, general superintendent of transportation, Chicago, Milwaukee, St. Paul & Pacific; J. H. Doggrell, superintendent transportation, St. Louis & San Francisco; J. R. Downes, chief of freight transportation, Pennsylvania; O. E. Hallberg, superintendent of car service, Chicago & Northwestern; J. O. Halliday, assistant general manager, New York, New Haven & Hartford; J. W. King, general superintendent of transportation, Chesapeake & Ohio; C. E. Lanham, superintendent transportation, Gulf, Mobile & Northern; W. T. Long, superintendent transportation, Texas & Pacific; G. Metzman, manager freight transportation, New York Central Lines.

This committee, in conjunction with the co-ordinator's section of car pooling, will consider methods of organization and rules for the distribution of cars under pool operation. The selection of this committee is not to be understood as definite approval of the principle of car pooling, but is a further step in the consideration being given to the subject.

Club Meetings

The Northwest Car Men's Association (St. Paul) will hold its next meeting at the Y. M. C. A. Gymnasium, Minnesota Transfer, on Monday evening, April 2. W. J. Gratrick, general car foreman, M. St. P. & S. S. M., will present a paper on inspection and classification of cars for commodity loading.

The Indianapolis (Ind.) Car Inspection Association will hold its next meeting at Hotel Severin, Indianapolis, on Monday evening, April 2, at 7 o'clock. The speaker will be W. J. Patterson, director of the Bureau of Safety, Interstate Commerce Commission.

The Toronto (Ont.) Railway Club will hold its next meeting on Friday evening, April 6, at the Royal York Hotel, Toronto. "Do We Need a New Deal in Car Handling?" will be discussed by W. C. Kendall, A. R. A., Washington.

The New England Railroad Club will hold its next meeting at the Copley-Plaza Hotel, Boston, on Tuesday, April 10, at 6:30 p. m. L. K. Sillcox, vice-president of the New York Air Brake Company, will review recent progress in the development of cars and locomotives.

At the regular monthly meeting of the Central Railway Club of Buffalo, N. Y., to be held on April 12, a paper on Air Conditioning will be presented by A. B. Lawson, assistant engineer of the Baltimore & Ohio.

Further Increases in Tie Stocks

Reports filed with the Railway Tie Producers' Association by 14 companies which supply approximately 85 per cent of the crossties produced for American railways by commercial firms show that these companies had 7,110,225 crossties in stock on February 1. This was 254,345 or 3.5 per cent more ties than were in stock in the previous month; 1,240,899 or 21.0 per cent more ties than were in stock on February 1, 1933, and shows a continued increase in stocks since last August, when the total number available in the yards of these companies was 5,063,020. The increase since that time is 40 per cent. Prior to August, tie stocks had shown a steady decline from January, 1932.

Of the ties available on the first of February, 4,763,598 or 67 per cent were 8 ft. long and 2,346,627 or 33 per cent were 8 ft. 6 in. long, while 578,215 or 8.1 per cent of the inventory were U-ties for use untreated; 4,368,057 or 61.5 per cent were oak ties for treatment, and 2,163,953 or 30.4 per cent were of other species for treatment. The largest quantity of ties was reported in the district comprising the states of Kentucky, Tennessee, Alabama, Mississippi, and that part of Louisiana east of the Mississippi river, the number being 2,956,893, which is contrasted with 3,049,326 in the pervious month and 2,326,317 last August. The next largest inventory was reported in the district comprising the states of New York, Pennsylvania, New Jersey, Delaware, Montana, Ohio, Indiana and Illinois, where 1,845,255 ties were in stock on February 1, as compared with 1,729,267 in the previous month and 1,414,287 last August. The third largest stock was reported in the district comprising the states of Nebraska, Iowa, Kansas, Missouri, Oklahoma, Arkansas, Texas and that part of Louisiana west of the Mississippi river, where the inventories consisted of 1,578,363, contrasted with 1,490,784 ties in the previous month and 864,036 ties last August.

Proposed Legislation

Two bills prepared by Co-ordinator Eastman, which accompanied his report transmitted to the President and Congress on March 10 recommending a plan of federal regulation of motor and water transportation, were introduced in the Senate on March 23 by Chairman Dill of the committee on interstate commerce, by request, and the committee is planning to take up consideration of them in about two weeks, although it is still somewhat uncertain as to whether hearings will be held this session. The bills are S. 3171 to amend the interstate commerce act to provide for the regulation of motor carrier transportation, and S. 3172, to amend the interstate commerce act to provide for the regulation of water carriers.

The Senate committee has appointed a sub-committee consisting of Senators Dieterich, Wheeler, Long, Couzens, and Hastings to consider the train-length bill and another sub-committee to consider the flagging bill.

The House committee on interstate and foreign commerce on March 27 began hearings on the six-hour day bill advocated by the Railway Labor Executives' Association, announcing that it would devote three days to hearing the advocates of the bill and two days the railroad side in opposition. The first witness was W. G. Cantley, of the Brotherhood of Railroad Trainmen, who presented on behalf of A. F. Whitney, chairman of the Railway Labor Executives' Association, the statement and exhibits which were recently presented at a hearing before the Senate committee.

The Senate on March 20 and the House on March 26 passed the bill to authorize steam railroads to electrify their lines within the District of Columbia after approval of detail plans by the District Commissioners.

The Senate on March 20 passed the bill to give a military status to the officers of the Russian Railway Service Corps.

Representatives of the railroads, the railroad labor organizations, and of the National Industrial Traffic League are working with members of Congress in an effort to obtain at this session of Congress a modification of the long-and-short-haul clause in Section 4 of the interstate commerce act. It is hoped to induce the committee on interstate and foreign commerce to allow hearings some time in April on the bill introduced for this purpose by Representative Pettengill, of Indiana. This bill was prepared by the National Industrial Traffic League and is in a form satisfactory also to the railroads and the labor organizations. The latter are conducting a vigorous campaign for the passage of the bill, in the interest of increasing railroad traffic and employment.

Port of New York Authority Annual Report

The Annual Report of the Port of New York Authority, in outlining the status of projects under way or planned, referred to the proposed freight tunnel under New York Bay between Jersey City, N. J., and Bay Ridge, Brooklyn. In connection with that project the report says that the tunnel as a self-liquidating project cannot be carried forward until financial agreements are reached with the railroads. It adds that "The Port Authority has urged that the improvement be recommended by the federal co-ordinator as a desirable joint undertaking by the carriers with possible financial aid from the Federal Government."

The railroads of the Port District were commended for joining in co-operation with the federal co-ordinator in the unification of harbor lighterage operations and also for the progress that was made in consolidating certain freight station facilities. It was stated that, following the appointment of Joseph B. Eastman as federal co-ordinator of transportation, the Port Authority had placed before Mr. Eastman and his cooperating railroad committee, its factual studies of potential economies to be secured through co-ordination of freight facilities within the Port District. The following terminal co-ordination pro-

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No Chance for Engine Failure Here

The condition of the superheater unit ball ends is an important factor in maintaining tight unit joints. Shop forces are familiar with the finishing and grinding of the ball ends necessary to maintain the proper metal-to-metal contact with the conical seats in the header.

But when the ball ends can no longer be restored by the usual shop processes, they should be replaced by new integrally forged and finished ball ends . . . . otherwise leaky joints or failure in service will result.

Replacing the ball ends is an important step in the Elesco unit remanufacturing service. Since no piecing or welding is employed, the ball ends furnished with remanufactured superheater units are in accordance with latest specifications . . . . and ready for another long uninterrupted period of service.

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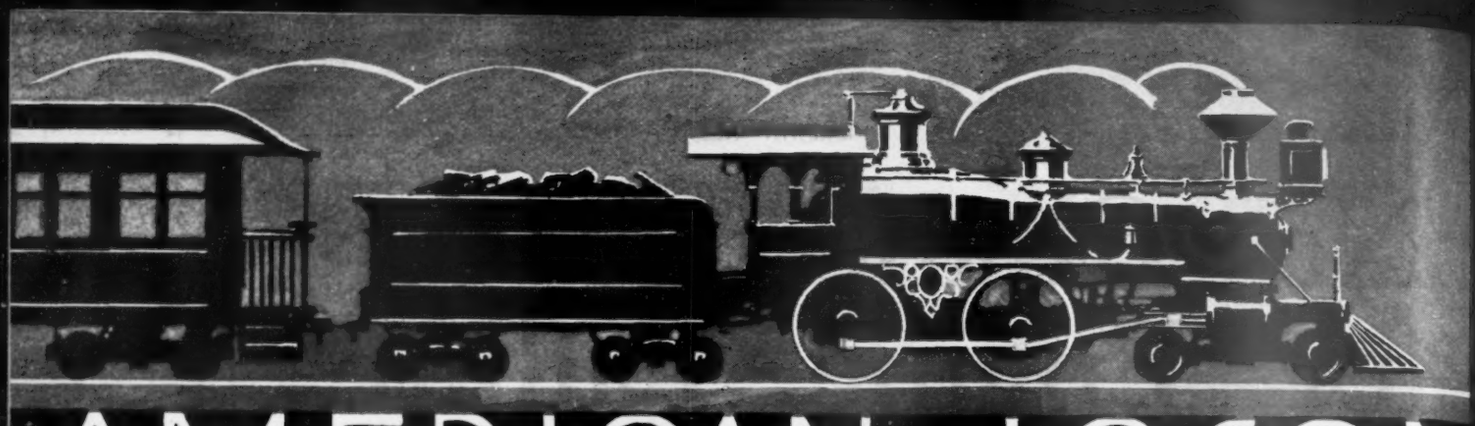

AMERICAN LOCOM

For practically a hundred years the American Locomotive Company and its constituent companies have been designing, developing and building motive power for railroads. In this time we have learned many things — many things not only about locomotives, but about railroading, and of equal importance to us, about what we ourselves have to do as vendors of locomotives. ■ Railroading, like most other industries, always has been in a constant state of change, and it is of this evolution that the American Locomotive Company must not only be well informed, no matter where in the four corners of the world it should occur, but also must endeavor to anticipate. ■ It quite naturally follows then that some years back we recognized that some day the Diesel engine would step out into main line railroad service. Therefore, in 1929, the American Locomotive Company purchased the McIntosh & Seymour Corporation, an old and well established concern noted for its modern heavy duty marine and stationary Diesel engines. Later, through the coordination of the Diesel experience of the McIntosh & Seymour organization with the American Locomotive Company's knowledge of general railway conditions of operation and their facilities for maintenance and repair, a special line of Diesel engines peculiarly adapted to Railway service was perfected. ■ It can be seen, therefore, that we are vitally interested in both Diesel and Steam power units. ■ While considering future tendencies and the evolution that railroading in this country is now facing, one cannot overlook the visit made here last year by the "Royal Scot." Such schedules as 94 miles from London to Coventry in 82

30 CHURCH STRE

OTIVE COMPANY

minutes, 177 miles from Wilmslow to Euston in 172 minutes, and 152½ miles from Crewe to Willesdon in 142 minutes, all done with a Ten-Wheeler weighing less than 100 tons, are more than impressive. How is this possible? Note — the weight of train has been kept within certain limits — less power is therefore needed in the locomotive — all tending toward better service plus more economical operation — in other words better railroading. ■ And right here, in this same line of thought, the American Locomotive Company wishes to say "More Power" to the Union Pacific. It took courage to go to the extent that this Railroad did. But it is this kind of courage that later on often is termed foresight. We always have, and always will admire and applaud this type of progressive research. And we confidently make this statement—that come what will, the affect of this new U. P. train will be seen in practically all future passenger equipment. ■ So to sum up in a few words, the position of the American Locomotive Company is — Lighter weight passenger trains are coming and in many cases with higher speeds. Where straight economics dictate that these trains be handled by Diesel engines, the American Locomotive Company has a Diesel engine peculiarly fitted for this job. In many cases; straight economics will dictate steam operation, and for these cases the American Locomotive Company has Streamlined designs ready to offer. ■ Switching and Freight service is another story. But the American Locomotive Company, constantly looking to the future, has modern designs for these services, which, in the search for more economical operation, must be considered.

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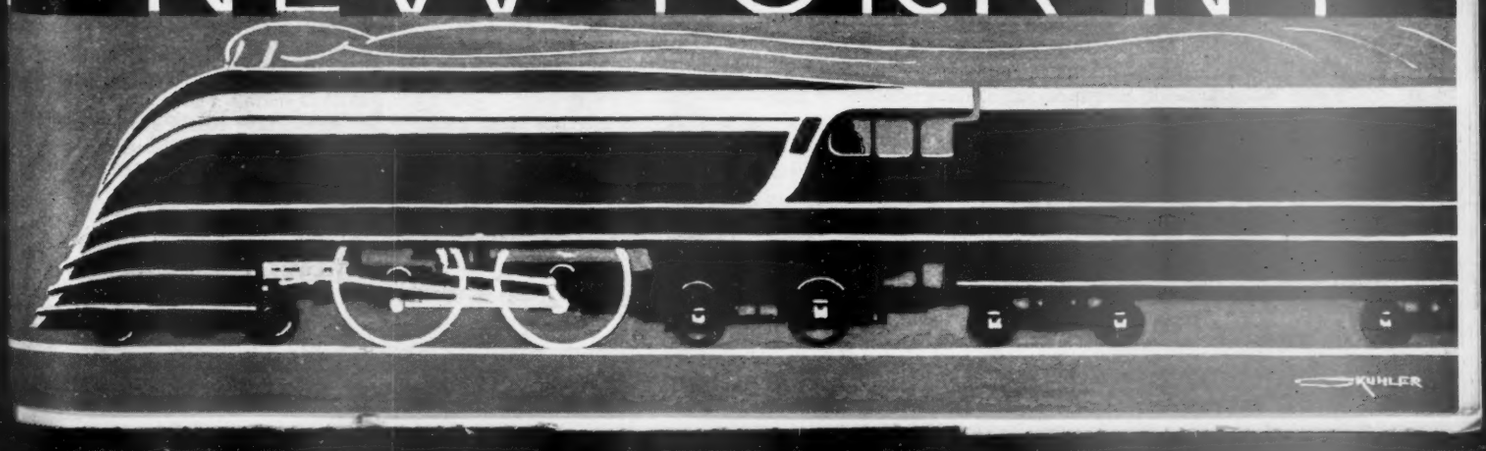

gram was submitted to the Federal Co-ordinator:

Gradual closing down of pier stations in Manhattan and Brooklyn and replacing same with consolidated store-door delivery and union freight stations. The ownership and operation of such common facilities and services to be vested in the carriers themselves.

Unified operation, similar to Terminal Association of St. Louis, of existing belt line trackage, including new belt line tunnel from Greenville to Bay Ridge and greater use of New York Connecting Railroad; for interchange of freight between trunk line carriers and to and from steamship piers and industrial sidings located on the rails of other carriers.

Consolidation of railroad marine equipment (excluding ferries) into a union boat holding corporation that will arrange for the operation of such equipment, under one head, for the handling of all harbor traffic of all carriers on a uniform basis.

Consolidation of railroad lighterage piers where freight is transferred from railroad cars to marine equipment, for the purpose of securing more efficient use of the terminals themselves and heavier loading of marine equipment.

Produce terminals of individual carriers in Manhattan and New Jersey to be co-ordinated into union perishable food terminals, open to all carriers on equal terms and operated by a union produce terminal company.

Consolidation of local merchandise freight stations of Northern New Jersey into a number of strategically located union stations, supplemented by some system of store-door delivery.

The foregoing, the report says, was followed up by filing of a memorandum developing the program in more detail and showed an estimated saving of approximately $7,500,000 per annum. Detailed data covering the several phases were subsequently furnished to the co-ordinator.

Durable Goods Industries Committee

Fifteen members, in addition to Chairman George H. Houston, president of the Baldwin Locomotive Works, have been selected to serve on the Durable Goods Industries Committee, which, as announced in the *Railway Age* of March 17, was recently created by Administrator Johnson of the N. R. A. The members are: C. R. Messinger of the Oliver Farm Equipment Company, Chicago, chairman of the code committee for the Farm Equipment Industry; S. F. Voorhees of Voorhees, Gmelin & Walker, Architects, New York; James W. Hook, president of the Geometric Tool Company, New Haven, Conn., administration member of the Code Authority for the Boiler Manufacturers Industry; Robert W. Irwin, of the Robert W. Irwin Company, Grand Rapids, Mich., chairman of the code authority for the Furniture Manufactury Industry; George P. Torrence, of the Link-Belt Company, Chicago, chairman of the code committee, for the Machinery and Allied Products Industry; Franklin R. Hoadley, of the Farrel-Birmingham Company, Ansonia, Conn., chairman of the code authority for the Gray Iron Foundry Industry; Lewis H. Brown, president of the Johns-Manville Corporation, New York, chairman of the code authority for the Asbestos Industry; C. C. Sheppard, president of the Louisiana Central Lumber Company, Clarks, La., president of the National Lumber Manufacturers Association; H. Gerrish Smith, president National Council of American Shipbuilders, chairman of the code authority for the Shipbuilding and Shiprepairing Industry; Harry S. Kimball, chairman of the code authority for the Fabricated Metal Products Industry; Walter J. Kohler, president of the Kohler Company, Kohler, Wis., chairman of the code authority for the Plumbing Fixtures Industries; F. A. Lorenz, Jr., general manager, Industrial Division, American Steel Foundries, Chicago, chairman of the code authority for the Steel Castings Industry; J. S. Tritle, of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., president of the National Electric Manufacturers Association; Alvan Macauley, president of the Packard Motor Car Company, Detroit, Mich., president of the National Automobile Chamber of Commerce; Charles R. Hook, president of the American Rolling Mill Company, Middletown, Ohio, and a member of the Iron & Steel Industry code authority. William B. Henderson, 701 Bowen building, Washington, D. C., is temporary secretary of the committee.

Railroad Labor Insists on Pay Restoration

(*Continued from page 478*)

the railway labor act, including mediation and, in the event of a failure to agree or submit to arbitration, the appointment of an emergency committee to investigate.

Later in the day the labor committee asked him to arrange for a conference with the President, which was held at the White House on Tuesday shortly before the President left Washington for a vacation of about ten days. Mr. Eastman first reported to the President the results of his negotiations. On emerging from the President's office, A. F. Whitney, chairman of the Railway Labor Executives' Association, said it had been decided to continue to work with Mr. Eastman in an effort to reach a settlement; and that if no settlement was reached before the President returned the matter would be again discussed with him before being referred to the Board of Mediation. On Wednesday morning Mr. Eastman again conferred with the labor committee and in the afternoon he saw the railroad committee again. He said he had gone over the whole situation and had asked some questions for information and planned to go over it himself before seeing the committees again.

Construction

THE BOSTON & MAINE is inquiring for bids on a considerable amount of bridge and building materials to be used in repairing various structures along its lines.

MISSOURI PACIFIC.—A contract has been awarded to Chapman & Bramer, Springfield, Mo., for the construction of a one-story 42-ft. by 180-ft. brick and frame depot and storage structure at Springfield to replace a building that was recently destroyed by fire.

PENNSYLVANIA.—This company has been directed by the New York Public Service Commission to proceed at once with the elimination of its Condensary crossing in the village of Fillmore, Allegheny county, N. Y., at an estimated cost of $85,000. See *Railway Age* of June 24, 1933, page 916.

Equipment and Supplies

P.W.A Loans to Railroads

Public Works Administrator Harold L. Ickes on March 20 signed a contract for a loan of $4,500,000 to the Baltimore & Ohio which will enable it to spend $5,484,406 this year in giving additional employment to its track and shop forces and purchasing materials, including 49,000 tons of rails and fastenings and materials required for repairing 240 locomotives and 5,000 freight cars. The B. & O. will spend the balance of $984,406 out of its own funds. Track materials to be purchased are 35,000 tons of rail and 14,384 tons of tie plates, track spikes and track bolts; together with 292,000 rail anti-creepers, 300,000 spring washers, 55,000 rail bonds and a quantity of other track devices costing $175,375. The total cost of all these materials will be $2,175,406, of which $1,325,000 will be paid out of the loan and $850,406 out of the company's own funds. The B. & O. management estimated that 393,400 man-hours of labor will be required to put the track materials into place.

The Grand Trunk Western has applied to the Interstate Commerce Commission for approval of the expenditure of $250,000 for which it has applied to the P.W.A. for a loan, for the purchase of 4,250 tons of 130-pound head-free rail, together with fastenings and accessories.

The Public Works Administration has allotted $1,200,000 to the Chicago Great Western for the purchase of 500 box cars and has increased its allotment to the Central of Georgia from $500,000 to $600,000 for 200 seventy-ton coal cars instead of fifty ton cars.

The Chicago Great Western has applied to the Interstate Commerce Commission for approval of the proposed expenditure and for authority to issue equipment trust certificates.

The P. W. A. has signed a contract with the New York, Ontario & Western for a loan of $235,000 for rails and has sent to the Pennsylvania a check for $629,000 for the purpose of beginning work on electric locomotives; another check for several million will be sent to the P. R. R. next week for electrification and car construction.

LOCOMOTIVES

THE SEABOARD AIR LINE is inquiring for five locomotives of the 2-6-6-4 Mallet type.

FREIGHT CARS

THE SEABOARD AIR LINE is inquiring for 1,000 steel box cars of 50 tons capacity.

THE PENNSYLVANIA has ordered 500 cast steel underframes for freight cars from the General Steel Castings Corporation.

PASSENGER CARS

THE ERIE has ordered eight all-steel combination passenger, baggage and mail

cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of February 17.

THE GULF, MOBILE & NORTHERN is inquiring for 10 passenger train cars consisting of two 75- to 80-ft. gas electric combination passenger and baggage cars, four power cars, two straight passenger cars and two observation sleeper cars.

IRON AND STEEL

THE NORFOLK & WESTERN is in the market for 10,000 tons of 131-lb. rail.

THE BOSTON & MAINE has placed orders for 30,000 tons of rail and 10,000 tons of fastenings and accessories.

CENTRAL OF NEW JERSEY.—An order for 240 tons of steel has been given to the Phoenix Bridge Company. This is to be used in building a structure to carry the tracks of the Central of New Jersey over New Jersey State Highway Route 25, at Spring street, Elizabeth, N. J.

THE AMERICAN IRON & STEEL INSTITUTE has extended from July 1 to August 31 the time for making deliveries on orders for steel rails, angle bars, rail joints, tie plates and track spikes, also on sales to manufacturers of special railroad track supplies, if the sales are made to consumers prior to April 15. A similar ruling has been adopted regarding structural projects in which the government is interested through the Public Works Administration or the Reconstruction Finance Corporation.

MISCELLANEOUS

THE BOSTON & MAINE is inquiring for new de luxe seats in ten passenger cars; air conditioning equipment for ten de luxe passenger coaches now in service and also for air conditioning equipment for four dining cars now in service.

Air Conditioning

The Baltimore & Ohio will install mechanical air-conditioning apparatus in 42 Pullman cars, 16 coaches and 41 dining and lounge cars.

The Chicago & North Western has placed an order with the Melcher Company for mechanical air-conditioning apparatus for two lounge cars.

The Delaware, Lackawanna & Western has placed an order with the Safety Car Heating & Lighting Company for ice air-conditioning apparatus for six dining, two buffet and one club car, and another with the Pullman Company for ice apparatus for seven sleeping cars and seven parlor cars.

The Southern Pacific has placed an order with the Pullman Company for the installation of mechanical air-conditioning apparatus in 6 Pullman club cars, 12 Pullman observation cars and 22 Pullman room cars, and another with the Pullman Car & Manufacturing Corporation for mechanical air-conditioning apparatus for 5 dining cars. Ice air-conditioning apparatus will be installed by the railroad in 5 dining, 4 observation, 7 lounge, 4 club and 2 parlor cars.

Supply Trade

Harold S. Russell, 332 South Michigan avenue, Chicago, has been appointed representative for the **Schaefer Equipment Company,** Pittsburgh, Pa.

J. Clay Lee, assistant manager of the railway sales division of the Standard Oil Company of Indiana, has been appointed manager of the division, effective April 1, with headquarters at Chicago.

Ahrens & Richardson, 30 Church street, New York, in addition to other accounts, have been given exclusive charge of sales in the eastern territory for the **Foster-Johnson Reamer Company,** Elkhart, Ind., handling a full line of reamers for air-brake maintenance and repairs.

W. M. Stevenson, for the past four years district representative of the **Crucible Steel Company of America,** at Rockford, Ill., has been transferred to the railway department of that company, with headquarters at 1258 East Fifty-fifth street, Cleveland, Ohio.

The Safety Car Heating & Lighting Company will move its executive offices about April 14 from 75 West Street to 230 Park avenue, New York City. **Arthur B. Mills,** sales representative of the Safety Car Heating & Lighting Company at Boston, Mass., has been appointed manager of the New England sales district with headquarters as heretofore at Boston.

William H. Winterrowd, vice-president of the **Lima Locomotive Works Incorporated,** has resigned, effective April 1, to become a vice-president of the **Franklin Railway Supply Company,** assuming the duties heretofore carried on by vice-president **J. L. Randolph,** who has resigned. Mr. Winterrowd's headquarters will be in Chicago. Mr. Winterrowd was

William H. Winterrowd

born April 2, 1884, at Hope, Ind. He attended the high school at Shelbyville, Ind., and was graduated from Purdue University in 1907. During his summer college vacations he worked as a locomotive wiper on the Missouri Pacific, blacksmith's helper on the Lake Erie & Western (now the New York, Chicago & St. Louis) at Lima, Ohio, and as a car and air brake repairman on the Pennsylvania, Lines West of Pittsburgh, at Dennison, Ohio. After graduation he became a special apprentice on the Lake Shore & Michigan Southern, following which he was enginehouse foreman on the Lake Erie, Alliance & Wheeling (now New York Central); night enginehouse foreman on the Lake Shore & Michigan Southern, at Youngstown, Ohio, and roundhouse foreman on that road at Cleveland. In 1910 he became assistant to the mechanical engineer of the Lake Shore & Michigan Southern. In 1912 he was made mechanical engineer of the Canadian Pacific, and in 1918 became chief mechanical engineer of that road, leaving that service in 1923 to become assistant to the president of the Lima Locomotive Works, Incorporated. Three years later, in 1926, he was made vice-president of that company, which position he now relinquishes. Mr. Winterrowd accompanied Sir George Bury to Russia in 1917 to assist in compiling a report for the Russian government on its transportation system, and was in that country during the Kerensky revolution. He was president of the Canadian Railway Club in 1920-21. He has served as a member of the publication committee of the American Society of Mechanical Engineers and was chairman of that committee in 1932. He has taken an active interest in the Railroad Division of The American Society of Mechanical Engineers and is now chairman of its program and papers committee. Before leaving railroad service he was a member of the General Committee of the Mechanical Division of the American Railway Association.

Fairbanks, Morse & Co.

The annual report of Fairbanks, Morse & Co. shows a loss of $1,147,339 in 1933, as compared with $2,547,231 in 1932. The current assets of the company amounted to $11,658,482 and the current liabilities to $1,016,897. A summary of the consolidated income and unappropriated surplus account for the year ending December 31, 1933, as compared with the previous year, follows:

	1933	1932
Net sales	$8,907,945	$8,584,902
Cost of sales, selling, administrative expenses, etc.	9,387,495	10,104,974
Gross operating loss	$479,550	$1,520,072
Net profit of Municipal Acceptance Corporation	.....	127,052
Operating loss	$479,550	$1,393,020
Depreciation	414,788	392,138
Interest on debentures	313,333	329,333
Adjustment of inventory valuation	.....	432,740
Net operating loss	$1,207,671	$2,547,231
Net income of Municipal Acceptance Corporation	60,332	.....
Consolidated net loss	$1,147,339	$2,547,231
UNAPPROPRIATED SURPLUS ACCOUNT		
Balance December 31, 1932	$4,345,535	$6,827,473
Add: Discount on debentures purchased for sinking fund	95,204	65,293
Deduct consolidated net loss	1,147,339	2,547,231
Balance	$3,293,400	$4,345,535

Railway Car Appliances Industry Code Authority Member

The National Recovery Administration on March 22 announced the appointment by General Johnson of Elmer M. Naylor, vice-president of the Naylor Pipe Company, Chicago, to be administration

member of the code authority for the supplementary code of Fair Competition for the Railway Car Appliances Industry. This is a division of the Fabricated Metal Products Manufacturing and Metal Finishing and Metal Coating Industry. Mr. Naylor will serve without expense to the industry, unless the supplementary code authority agrees to bear such expense, and he is appointed to serve during the pleasure of the Administrator.

Pullman, Inc., Annual Report

The annual report of Pullman, Inc., for the year ending December 31, 1933, shows a loss of $2,672,864, as compared with a loss of $3,834,724 in 1932. Dividends paid amounted to $11,460,294. Current assets totaled $73,622,472 and current liabilities $10,668,844, as compared with $75,170,633 and $10,892,751, respectively, in 1932. The consolidated income account as of December 31, 1933, in comparison with 1932, follows:

Earnings:	1933	1932
From sleeping car business of The Pullman Company, after deducting all expenses incident to operations	$8,621,543	$8,773,520
Less: Charges and allowances for depreciation	9,185,969	9,993,554
	*$564,426**	*$1,220,034**
From all manufacturing business, Pullman Railroad and other miscellaneous properties, after deducting expenses incident to operations	*$1,046,937**	*$1,309,067**
Less: Charges and allowances for depreciation	2,778,140	2,765,763
	*$3,825,077**	*$4,074,830**
From security investments, etc., less administration expense of Pullman, Inc.	$1,716,639	$1,460,140
Balance (deficit) carried to surplus	*$2,672,864**	*$3,834,724**

* Figures in italics denote deficit.

David A. Crawford, president, in his letter to stockholders, says in part:

The year 1933 witnessed the termination of the long down-trend in rail passenger traffic and earnings, and the initiation of a campaign designed to stimulate railroad passenger travel through a substantial reduction in travel costs and the modernization of passenger facilities. After several years of experimentation with rail passenger charges in more or less limited traffic areas for short periods, and following the lead of certain southeastern carriers earlier in the year, the western roads as a whole, on December 1, eliminated the surcharge on Pullman tickets and sharply reduced basic passenger fares, for a test period of six months. These new passenger rate schedules in the South and West continue the practice of differential rates against the use of Pullman accommodations. In the opinion of the Pullman management these differential rates, which reinstate in another form and often in greater amount the old surcharge, work to the disadvantage of both the railroads and Pullman in deterring development of the greatest revenue possibilities of rail travel, and have been consistently opposed by Pullman. It is hoped that such extreme differentials as those now current in the South and West will eventually be abandoned or at least greatly reduced in amount by the railroads.

The marked expension in railroad traffic and earnings since April last year and the indications of further economic betterment in 1934 afford encouragement to equipment manufacturers and suggest that the long delayed movement for rehabilitation of railroad equipment and facilities may get under way before the end of the year. Evidence supporting that belief is found in the fact that equipment orders placed thus far in 1934, aggregating 13,225 freight cars and 195 passenger cars, approximate the total of equipment orders placed during the entire preceding three-year period, 1931-1933.

Among the major factors favorable to early resumption of large scale equipment purchases are (1) the attractive financing arrangement offered by the Public Works Administration, whose loan allotments to the railroads to date exceed $200,000,000; (2) the subnormal condition of railroad rolling stock as disclosed by a survey recently completed by the federal co-ordinator of railroads; (3) the substantial amount of deferred replacement and of obsolescence of equipment confronting the railroads; and (4) the increased demand for cars generated by the sustained increase in carloadings.

There is currently under way in the sleeping car and manufacturing subsidiaries an unusually large volume of developmental work on new products and new methods, involving considerable investment, some of which may not have continuing operating usefulness. There has accordingly been appropriated out of surplus the sum of $750,000 as a reserve for experimental cars and installations.

General Electric Company

The forty-second annual report of the General Electric Company for the year 1933 shows profit available for dividends of $13,429,739, equivalent, after dividends of 6 per cent on special stock, to 38 cents per share on 28,845,927 shares of no par value common stock, compared with $14,404,110, or 41 cents per share, on the same number of shares in 1932. Dividends of 60 cents per share on the special stock and 40 cents per share on the common stock amounted to $14,112,633, resulting in a deficit from operations of $682,894, which was taken from surplus.

Orders received during 1933 were $142,770,791, compared with $121,725,772 for 1932, an increase of 17 per cent. Orders received exceeded shipments during 1933 for the first time since 1929, so that unfilled orders were greater at the end than at the beginning of the year. Sales billed during 1933 amounted to $136,637,268, compared with $147,162,291 for 1932, a decrease of 7 per cent. Billing during the fourth quarter was the largest for any quarter since the second of 1932.

A comparative statement of income and earned surplus for the years 1933 and 1932 follows:

	1933	1932
Net sales billed	$136,637,268	$147,162,291
Costs, expenses, and all charges except plant depreciation and interest	123,585,653	136,951,671
	$ 13,051,615	$ 10,210,620
Plant depreciation	6,179,511	6,580,575
Net income from sales	$ 6,872,104	$ 3,630,045
Income from other sources:		
Interest and dividends from associated companies and miscellaneous investments	$ 4,376,971	$ 7,392,647
Interest on marketable securities	717,342	227,039
Interest on bank balances and receivables	1,266,460	3,079,795
Royalties and sundry revenue	606,575	487,125
	$ 6,967,348	$ 11,186,606
Total income	$ 13,839,453	$ 14,816,651
Interest charges	409,714	412,541
Net income for the year	$ 13,429,739	$ 14,404,110
Earned surplus at beginning of year	122,224,720	172,198,374
	$135,654,459	$186,602,484
Revaluation of investment in and advances to associated companies, and of miscellaneous investments	3,920,210	19,498,310
Earned surplus available for dividends	$131,734,249	$167,104,174
6% Cash dividends on special stock	2,575,057	2,575,033
Earned surplus available for dividends on common stock	$129,159,192	$164,529,141
Cash dividends on common stock	11,537,576	15,864,157
Dividend payable in RCA common stock		26,440,264
Earned surplus at end of year	$117,621,616	$122,224,720

The Pullman Company—Traffic and Operating Statistics
Comparative Statement for Years Ended December 31.

Item	1929	1930	1931	1932	1933
Cars Owned	9,529	9,860	9,483	9,279	8,478
Cars Operated	8,842	8,559	7,402	5,693	4,944
Car Miles	1,206,767,059	1,183,668,557	1,025,164,501	799,484,608	710,747,267
Revenue Passengers:					
Berth	21,008,719	18,498,844	14,583,183	10,185,444	9,248,461
Seat	12,425,549	10,861,342	8,401,738	5,564,063	4,468,077
Total	33,434,268	29,360,186	22,984,921	15,749,507	13,716,538
Revenue Passenger Miles	14,058,525,111	12,515,414,775	9,891,910,222	6,757,760,858	6,141,986,577
Revenue from Cars	$83,840,812	$77,666,074	$63,683,507	$44,196,043	$39,316,239
Average per car	$9,482.32	$9,074.31	$8,603.44	$7,763.50	$7,952.31
Expenses	$74,655,613	$72,729,214	$60,773,171	$45,416,077	$39,880,665
Average per car	$8,443.29	$8,497.40	$8,210.37	$7,977.53	$8,066.48
Net Revenue from Cars	$9,185,199	$4,936,860	$2,910,336	*$1,220,034**	*$564,426**
Traffic Averages:					
Average Revenue per Passenger	$2.51	$2.65	$2.77	$2.81	$2.87
Average Net Revenue per Passenger	$0.27	$0.17	$0.13	*$0.08**	*$0.04**
Average Net Revenue per Car per Day	$2.85	$1.58	$1.08	*$0.59**	*$0.31**
Average Mileage per Car Operated	136,484	138,297	138,496	140,438	143,760
Average Journey per Passenger (Miles)	420	426	430	429	448
Average Miles per Car per Day	374	379	379	384	394
Average Loading per Car (Passengers)	11.65	10.57	9.65	8.45	8.64

* Figures in italics denote loss.

Safety Car Heating & Lighting Company Annual Report

The Safety Car Heating & Lighting Company, for the year ending December 31, 1933, reported a profit before depreciation of $238,596, as compared with a 1932 profit before depreciation of $232,736. Except for the complete write-off of new assets as they are acquired, no depreciation charges now enter the accounts of this company; stockholders at the last annual meeting approved the plan which resulted in setting up a depreciation reserve equal to the entire amount of the fixed assets, less one dollar, which latter is the nominal figure at which these assets are now carried. Thus, the 1933 depreciation charge was $7,421, the amount required to write-off new assets acquired during last year. The 1933 profit available for dividends or additions to surplus was, therefore, $231,175.

The company's current position con-

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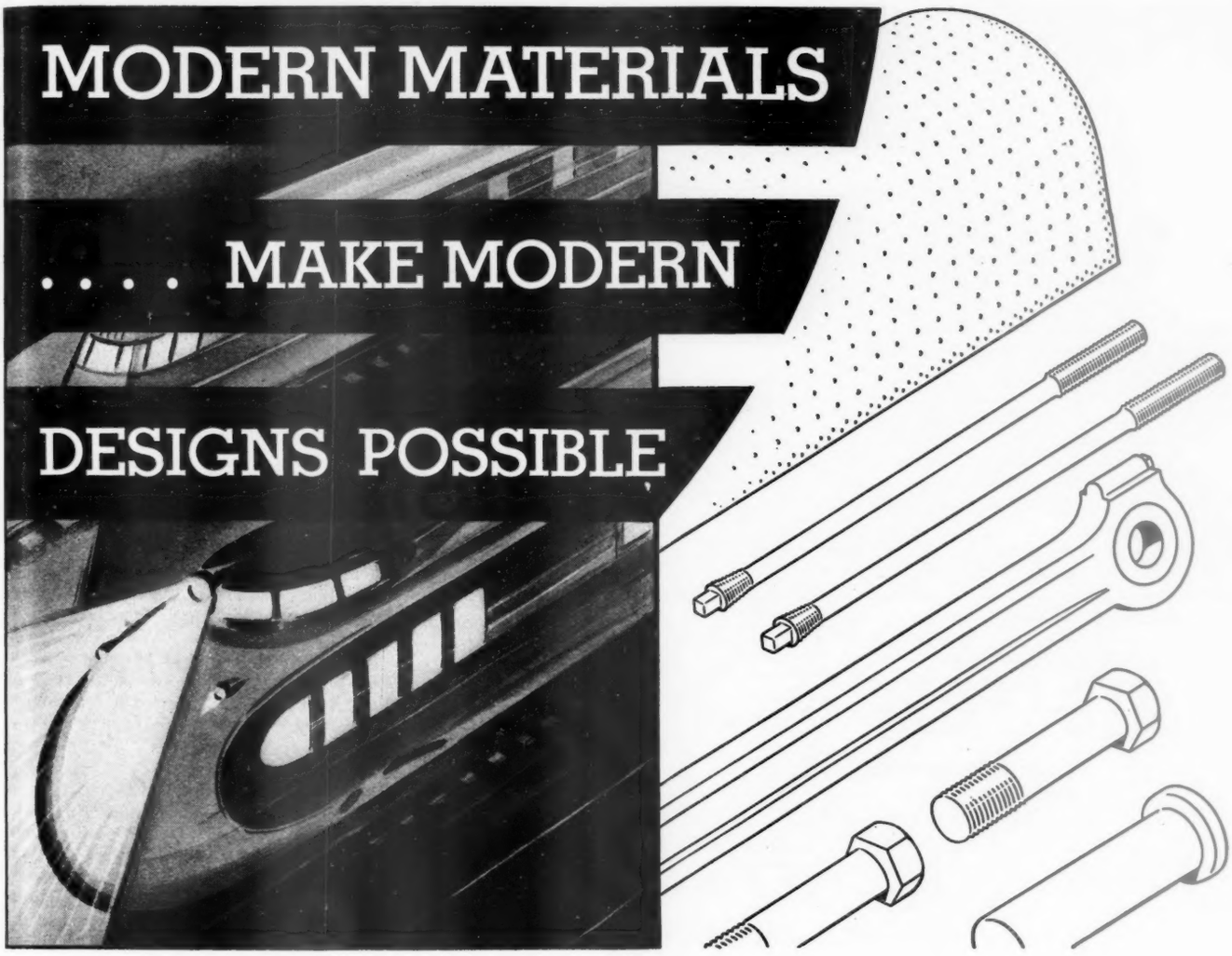
MODERN MATERIALS .... MAKE MODERN DESIGNS POSSIBLE



Lightweight, stream-lined equipment has focused attention on the importance of new and improved materials in modern railroading. • • • Less spectacular but equally important has been the influence of improved materials on standard equipment. • • • Cars have had their life prolonged by repairing with corrosion-resisting Toncan Iron sheets. • • • Fireboxes have been given the protection of special alloy irons and steels, resulting in longer service between shoppings. • • • Staybolts have greater fatigue resistance, thanks to Agathon Nickel Iron. Non-stretching Agathon engine bolt steel has also kept equipment out of the shop. • • • These are only a few examples of the many special materials developed by Republic metallurgists to help the railroads attain greater reliability of performance and lower maintenance costs. • • • Consult Republic on your materials problems.

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Agathon Iron for pins and bushings • Agathon Staybolt Iron • Climax Steel Staybolts • Upson Bolts and Nuts • Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel.

The Birdsboro Steel Foundry & Machine Company of Birdsboro, Pa. has manufactured and is prepared to supply under license, Toncan Copper Molybdenum Iron castings for locomotives.

CENTRAL ALLOY DIVISION, MASSILLON, OHIO

AGATHON NICKEL IRON

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

TONCAN IRON

tinues unusually strong, since the balance sheet shows the ratio of current assets to current liabilities to be 70 to 1. The report noted a slight increase in the volume of orders during 1933 particularly in repair and renewal material. It points out how the demand for the transportation of perishable foods has been adversely influenced by the market for such products, which condition was reflected in a curtailed use of refrigerator cars.

"Increases in traffic and assistance through loans of public funds," the report continues, "have caused pronounced activity on the part of the railroads in the purchase of air conditioning equipment, and it is gratifying to report that the operating reliability and low cost of maintenance of our air conditioning apparatus previously installed have resulted in several repeat orders as well as contracts for furnishing air conditioning equipment on several railroads which had not previously used our device.

"Improved conditions give rise to the hope that it may be financially possible for the railroads to greatly extend the use of this latest improvement in passenger car equipment for the summer of 1935. New business already booked together with orders which would ordinarily be anticipated insure the profitable operation of your Company during the present year."

General American Transportation Corporation

The annual report of the General American Transportation Corporation and its subsidiaries for 1933 shows a net profit of $1,974,558, as compared with a profit of $1,638,962 in 1932. The consolidated summary of income and the consolidated surplus account follow.

	1933	1932
Gross income from sales, rentals, etc.	$19,728,294	$17,958,042
Add dividends, interest and other income from investments	337,679	448,608
	$20,065,973	$18,406,650
Less: Cost of sales, expenses and all taxes.	$11,799,051	$10,220,873
Interest on car equipment notes	1,609,609	1,862,903
Depreciation	4,478,651	4,434,455
Provision for dividends of subsidiaries	204,104	249,457
	$18,091,415	$16,767,688
Net profit	$1,974,558	$1,638,962
Balance — December 31, 1932	$44,628,699	$43,894,918
Net profit for year ended December 31, 1933..	1,974,558	1,638,962
Add excess over par value of $5 per share on: 20,000 shares used to acquire properties	320,360	.....
43,951 shares sold for cash	1,271,589	.....
	$48,195,206	$45,533,880
Less 21,456 shares acquired, principally in exchange of investments	581,745	.....
Reinstatement of cost values of marketable securities, now below market, previously written down through surplus	802,962	.....
	$48,416,423	$45,533,880
Deductions:		
Dividends paid and provided for	786,549	745,648
Adjustment of cost of treasury stock acquired during 1932 to $5 per share stated value	.....	159,532
	$47,629,874	$44,628,699

Financial

CANADIAN NATIONAL.—*Annual Report.*—The income account of the Canadian National System (including Eastern Lines) for 1932 shows a net income deficit before interest of $3,552,286, as compared with a deficit of $4,041,640 in 1932. The consolidated statement of receipts and expenditures for the years 1923-33, the period in which the C. N. R. has been operated under a unified management shows that in that period $219,209,184 has been earned over and above operating expenses to apply on interest. Selected items from the income statement of 1933, as compared with 1932, follow:

	1933	1932	Increase or Decrease
Railway Operating Revenues	$148,519,742	$161,103,594	-$12,583,852
Railway Operating Expenses	142,812,559	155,208,161	-12,395,602
Net Revenue from Railway Operations	5,707,183	5,895,433	-188,250
Net after Taxes	330,663	549,422	-218,759
Net Deficit from Hotel Operations	172,974	59,482	+113,492
Gross Income	7,553,817	9,896,451	-2,342,634
Net Deficit before Interest	3,552,287	4,041,640	-489,353
Net Deficit before Interest on Government Loans	60,017,713	61,006,919	-989,206
Net Deficit Including Interest on Government Loans	96,051,854	96,532,459	-480,605

CAROLINA & NORTHEASTERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon its entire line extending from a connection with the Seaboard Air Line at Gumberry, N. C., to Jackson, 8 miles.

CENTRAL OF GEORGIA.—*P.W.A. Loan.*—The receiver has applied to the Interstate Commerce Commission for approval of the expenditure of $120,000 for the purchase of 3,000 tons of 90-pound rail and fastenings and for authority to issue receiver's certificates for the amount to the Public Works Administration.

CHICAGO & NORTH WESTERN.—*Leases Controlled Line.*—The Interstate Commerce Commission has authorized this company to lease the Escanaba, Iron Mountain & Western, a 49.3-mile line between Escanaba, Mich., and Antoine, which it already controls by the ownership of all its securities.

CHICAGO & NORTH WESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to pledge as collateral for short-term loans $9,850,000 of first and refunding mortgage 5 per cent bonds, $4,190,000 of general mortgage 4½ per cent bonds, $8,228,000 of first and refunding mortgage 4½ per cent bonds, and $2,044,000 of first and refunding mortgage 4½ per cent bonds.

CHICAGO, BURLINGTON & QUINCY.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch line extending from Yutan, Nebr., to a point near Allis, 4.9 miles.

CHICAGO, BURLINGTON & QUINCY-WABASH.—*Abandonment.*—A joint application filed with the Interstate Commerce Commission asks authority for the Burlington to abandon 8.34 miles of its line and for the Wabash to abandon 11.2 miles of its line between Albia, Ia., and Tracy, and for the extension of operations over each others' tracks between those points.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC-NORTHERN PACIFIC.—*Abandonment and Trackage Rights.*—These companies have filed with the Interstate Commerce Commission a joint application for authority to abandon the jointly-owned line between Vader Junction, Wash., and Longview, 19.35 miles, for the Milwaukee to extend its operations over the line of the Northern Pacific between Olequa, Wash., and Longview Junction, 20.36 miles, and for the Longview, Portland & Northern to extend its operations over the Northern Pacific between Vader Junction and Longview Junction, 21.93 miles, and between Longview Junction and Longview.

DENVER & RIO GRANDE WESTERN.—*New Director.*—Robert E. Coulson, attorney of New York, has been elected a director of this company succeeding F. H. Ecker, president of the Metropolitan Life Insurance Company.

DENVER & RIO GRANDE WESTERN.—*Seeks to Defer Interest Payment.*—This company has asked holders of its general mortgage sinking fund 5 per cent bonds to forego interest temporarily on the payment which was due February 1, agreeing to accept one-half in cash and in turn deferring the payments due August 1 this year and in February of next year until December 1, 1935.

GRAND TRUNK WESTERN. — *P.W.A. Loan.*—This company has applied to the Interstate Commerce Commission for authority to issue $250,000 of 4 per cent notes to the Public Works Administration for a loan for the purchase of rails.

GREAT NORTHERN.—*P. W. A. Loan.*—This company has applied to the Interstate Commerce Commission for authority to issue $4,935,000 of ten-year 4 per cent serial bonds, secured by collateral trust indenture, in connection with loans from the Public Works Administration for maintenance of way and equipment, and for authority to pledge as collateral $7,000,000 of general mortgage 6 per cent bonds.

MISSOURI PACIFIC. — *Abandonment.* — The Interstate Commerce Commission has authorized the trustees of this company to abandon a part of a branch line extending from Fort Scott, Kans., to Lomax, 90.5 miles, and a part of a branch line between Mound City and Le Roy, 46.8 miles. In giving its opinion authorizing the abandonment of the two segments, the Interstate Commerce Commission said: "The fact that most of the traffic of the two territories has been diverted to trucks materially lessens the force of contended need for the railroads. Use of the segments merely for the movement of commodities

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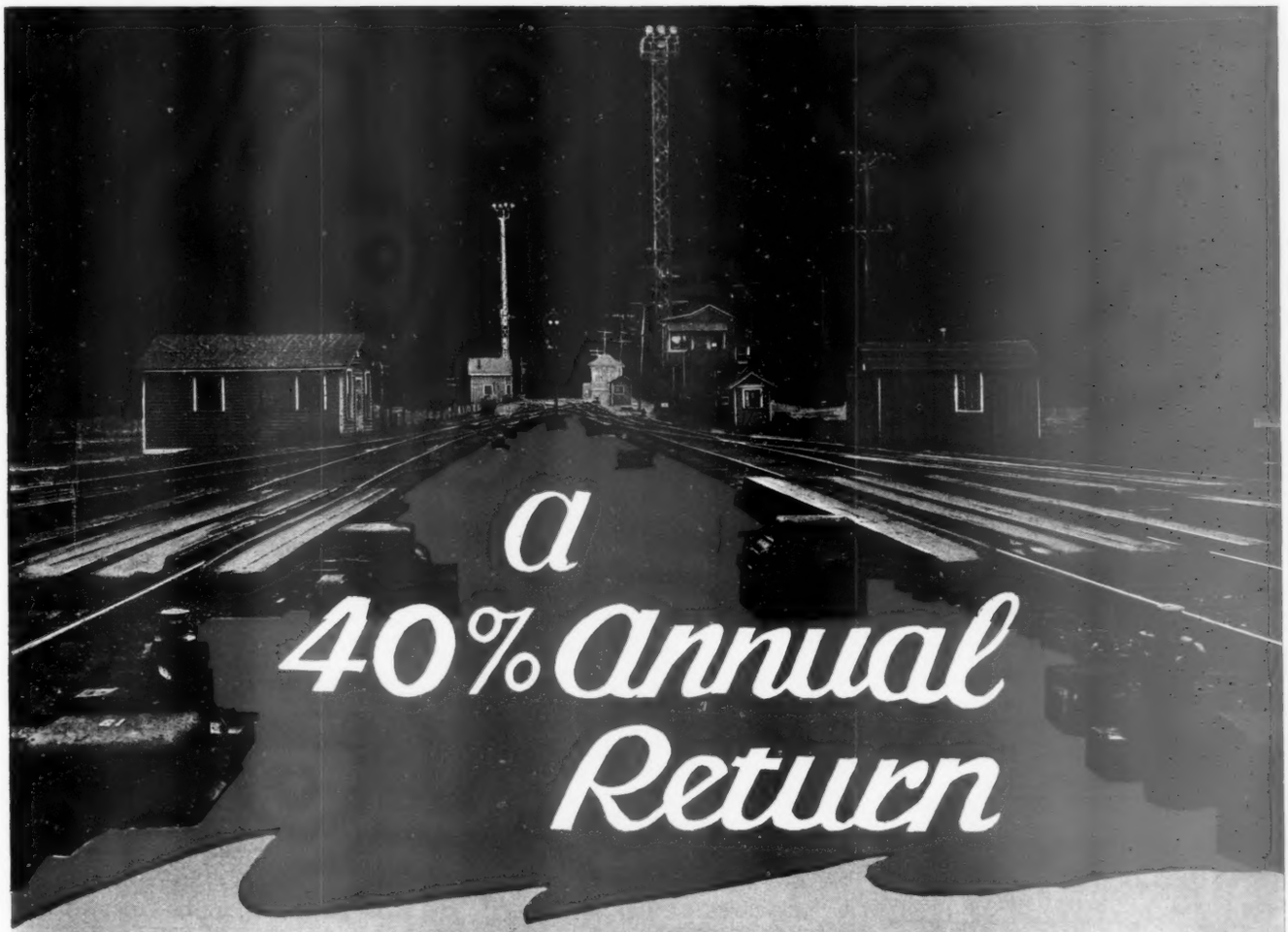

a 40% Annual Return

Following installation of "Union" Electro-Pneumatic Car Retarders in its Russell classification yard in 1929, the Chesapeake & Ohio Railroad compared operating costs under the old method and new. This comparison disclosed a reduction in operating expenses at the rate of $200,000 annually, or a return of about 40 per cent on the investment in retarders over and above interest and depreciation. Yard operating costs were reduced from 43 cents to 18 cents per car, or 58 per cent!*

"Union" Electro-Pneumatic Car Retarders maintain a smooth and continuous movement of cars through a terminal or yard; speed shipments; reduce accidents and facilitate yard operation. They will pay their way under abnormally low traffic conditions and earn a most lucrative return in normal times.

Our nearest district office will be glad to co-operate in estimating the savings to be effected by a proposed installation.

*Railway Age, September 13, 1930

1881 **Union Switch & Signal Co.** 1934

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

for which trucks are less suited, and for the remnant of other freight that is given to the lines, produces revenues entirely inadequate to support the cost of operation, and operation of the lines imposes an undue burden on interstate commerce. The record clearly establishes the necessity of utilizing every practicable means of reducing the applicant's expense."

LEHIGH & HUDSON RIVER.—*Annual Report.*—The 1932 annual report of this company shows net income after interest and other charges of $214,941, as compared with a net income of $181,593 in 1932. Selected items from the comparative income account follow:

	1933	1932	Increase or Decrease
RAILWAY OPERATING REVENUES	$1,443,351	$1,579,505	−$136,154
Maintenance of way	151,077	185,599	−34,522
Maintenance of equipment	230,219	242,925	−12,705
Transportation	486,375	565,330	−78,955
TOTAL OPERATING EXPENSES	982,743	1,125,613	−142,870
Operating ratio	68.1	71.3	−3.2
NET REVENUE FROM OPERATIONS	460,608	453,892	+6,716
Railway tax accruals	132,675	149,468	−16,793
Hire of equipment	85,049	91,930	−6,882
Joint facility rents	61,548	66,022	−4,474
NET RAILWAY OPERATING INCOME	181,337	146,472	+34,865
Non-operating income	34,118	35,761	−1,643
GROSS INCOME	215,455	182,233	+33,222
TOTAL DEDUCTIONS FROM GROSS INCOME	514	639	−126
NET INCOME	$214,941	$181,593	+$33,348

LEHIGH VALLEY.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon the line of the State Line & Sullivan from Bernice, Pa., to Monroetown, 24 miles.

LOUISVILLE & NASHVILLE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a line extending from Redding, Ala., southwesterly to Readers, 5 miles.

MINARETS & WESTERN.—*Abandonment.*—The Interstate Commerce Commission has authorized the trustees of this company to abandon as to interstate and foreign commerce the entire line of this company extending from Pinedale, Calif., to Pinedale Junction, 4.5 miles and from Friant to Wishon, 39.3 miles. The abandonment of operation under trackage rights over the Southern Pacific between Pinedale Junction and Friant, 9.9 miles, has likewise been authorized.

NEW YORK CENTRAL.—*Stock.*—This road has applied to the Interstate Commerce Commission for authority to issue no par stock in exchange for its present outstanding stock of $100 par value and to increase its authorized stock from seven million to ten million shares.

NEW YORK, ONTARIO & WESTERN.—*Annual Report.*—The 1933 annual report of this company shows net income, after interest and other charges, of $372,583, a decrease of $405,011, as compared with net income in 1932. Selected items from the income statement follow:

	1933	Increase or Decrease
RAILWAY OPERATING REVENUES	$9,644,523	−$927,353
Maintenance of way	1,127,817	−93,094
Maintenance of equipment	1,659,942	−165,555
Transportation	3,736,907	−259,086
TOTAL OPERATING EXPENSES	6,978,679	−543,508
Operating ratio	72.36	+1.21
NET REVENUE FROM OPERATIONS	2,665,844	−383,844
Railway tax accruals	438,578	−108,817
Railway operating income	2,226,127	−275,286
Equipment rents—Net	440,021	−114,384
Joint facility rents—Net	77,294	−9,482
NET RAILWAY OPERATING INCOME	1,708,812	−151,420
Non-operating income	252,529	−214,264
GROSS INCOME	1,961,342	−365,684
Rent for leased roads	235,331	7,456
Interest on funded debt	1,225,114	7,785
TOTAL DEDUCTIONS FROM GROSS INCOME	1,588,759	+39,327
NET INCOME	372,583	−405,011

PENNSYLVANIA.—*Bonds.*—The Cleveland & Pittsburgh has applied to the Interstate Commerce Commission for authority to reduce from 5 per cent to 4½ per cent the interest rate on $3,597,000 of general and refunding bonds, and the Pennsylvania has applied for appropriate modification of previous orders authorizing it to assume obligation and liability. The Pennsylvania has also asked authority to sell the bonds to Kuhn, Loeb & Co., at 99.75.

PENNSYLVANIA.—*Asks Dismissal of Investigation Proceedings.*—Counsel for the Pennsylvania have filed with the Interstate Commerce Commission a motion to dismiss the proceedings in connection with the investigation recently ordered as to the holdings of the Pennsylvania and the Pennroad Corporation in New England railroads, for misjoinder of causes of action. The motion states that the commission's order provides for the determination of two distinct issues or alleged causes of action which are not lawfully susceptible of investigation and consideration by the commission in one proceeding. One is supposed to arise out of the Clayton act, as to which any order which the commission might lawfully enter is reviewable in the circuit court of appeals and from that tribunal by writ of certiorari to the Supreme Court of the United States. The other is supposed to arise out of sundry provisions of the interstate commerce act as to which any order is reviewable by petition filed in the proper district court and heard in that court before three judges, and from that court by appeal to the Supreme Court. Such alleged causes of action, counsel stated, involve different issues and different procedure, and may not lawfully be investigated, tried or disposed of together in one proceeding or under one caption.

ST. LOUIS-SAN FRANCISCO.—*Abandonment.*—The Interstate Commerce Commission has authorized the receivers of this company to abandon operation of a branch line extending from Evadale Junction, Ark., to Deckerville, 18.1 miles, subject to the condition that they sell the line or any part of it to any responsible person or firm offering to purchase it for continued operation at a price not less than salvage value.

TENNESSEE CENTRAL.—*Annual Report.*—The 1933 annual report of this company shows net deficit, after interest and other charges, of $37,552, a decrease of $44,698 as compared with net deficit in 1932. Selected items from the Income Statement follow:

	1933	1932	Increase or Decrease
Average Mileage Operated	289.85	295.70	−5.85
RAILWAY OPERATING REVENUES	$1,923,154	$1,873,225	+
Maintenance of way	321,160	293,315	+49,929
Maintenance of equipment	282,980	271,509	+11,471
Transportation	652,413	688,842	−36,429
TOTAL OPERATING EXPENSES	1,431,675	1,455,162	−23,487
Operating ratio	74.44	77.68	−3.24
NET REVENUE FROM OPERATIONS	491,480	418,063	+73,417
Railway tax accruals	37,238	51,337	−14,099
Railway operating income	453,897	366,598	+87,299
Equipment rents—Net Dr.	182,140	149,109	+33,031
Joint facility rents—Net Dr.	5,458	5,505	−47
Non-operating income	11,641	15,180	−3,539
GROSS INCOME	465,538	381,777	+83,761
Rent for leased roads	62,504	62,504	
Interest on funded debt	231,380	228,846	+2,534
TOTAL DEDUCTIONS FROM GROSS INCOME	503,090	464,027	+39,063
NET INCOME—DEFICIT	$37,552	$82,250	−$44,698

Law

TWIN BRANCH.—*Capital Stock.*—The Interstate Commerce Commission has authorized this company to issue $52,500 of capital stock to be sold at not less than par and the proceeds used to pay for the railroad which it has acquired which formerly was operated by the Indiana & Michigan Electric Company.

WESTERN MARYLAND.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a 1.9-mile branch line extending from Valley Junction, Pa., to Codorus.

Average Prices of Stocks and of Bonds

	Mar. 27	Last week	Last year
Average price of 20 representative railway stocks.	44.63	45.83	25.77
Average price of 20 representative railway bonds..	77.77	78.32	54.92

Dividends Declared

Boston & Providence.—$2.125, quarterly, payable July 2 to holders of record June 20.

Cincinnati, Sandusky & Cleveland.—Preferred, $1.50, semi-annually, payable May 1 to holders of record April 16.

Elizabeth & Trenton.—$1.00, semi-annually: Preferred, $1.25, semi-annually, both payable April 2 to holders of record March 20.

Norfolk & Western.—Adjustment Preferred, $1.00, quarterly, payable May 19 to holders of record April 30.

Reading.—Common, 25c, quarterly, payable May 10 to holders of record April 12.

Vermont & Massachusetts.—$3.00 semi-annually, payable April 7 to holders of record March 13.

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WAUGH-GOULD
Type 403 DRAFT GEAR

AWARDED A. R. A. CERTIFICATE NO. 1

The Waugh-Gould Type 403 Draft Gears tested by the A.R.A. were standard type 403 Draft Gears, identical to thousands sold previous to the tests, and since. These gears, selected at random by the A.R.A. committee, had seen two years service (about 16,000 miles) on New York Central all-steel auto box cars, to which service they were returned after the tests were completed.

The results of these tests, therefore, give present users of Waugh-Gould Type 403 Draft Gears the assurance that Waugh-Gould draft gears now on their cars are giving protection to their cars and lading.

WAUGH EQUIPMENT COMPANY

WAUGH

420 Lexington Avenue, New York, N. Y.

Cleveland Chicago St. Louis

Canadian Waugh Equipment Company, Montreal, Que.

Railway Officers

EXECUTIVE

M. E. Pangle, assistant general superintendent of the Chicago & North Western, Lines West, with headquarters at Norfolk, Neb., has been appointed assistant to the president in charge of personnel, with headquarters at Chicago.

G. F. Butler, general traffic manager of the Norfolk & Western, with readquarters at Roanoke, Va., has been appointed vice-president in charge of traffic, with the same headquarters, to succeed **B. W. Herrman,** who died on March 18.

OPERATING

Charles E. Sainsbury, assistant superintendent of the Wisconsin division of the Chicago & North Western, with headquarters at Milwaukee, Wisc., has been promoted to assistant general superintendent, Lines West, with headquarters at Norfolk, Neb., succeeding **M. E. Pangle,** promoted. **Harley Thayer,** trainmaster of the Galena division, has been appointed assistant superintendent at Milwaukee, succeeding Mr. Sainsbury.

A. L. Hammell, superintendent of transportation and traffic of the Railway Express Agency, with headquarters at San Francisco, Cal., has been appointed general manager of the New England department of the agency with headquarters at Boston, Mass. Mr. Hammell began his career in 1909 with Wells Fargo & Company at San Francisco. He served with that company successively as shipping clerk in the foreign department, customs clerk, cashier and chief clerk of the foreign department. He was then transferred to the

A. L. Hammell

city division as commercial agent, later becoming supervisor of delivery service and then serving as inspector of wagon service. In 1915, when the Panama-Pacific International Exposition was held in San Francisco, Wells Fargo & Company handled many shipments to and from the exposition grounds and Mr. Hammell was appointed agent on the grounds. Subsequently Mr. Hammell served as route agent successively at Eugene and Portland, Ore., and early in 1917 he was appointed general agent at Salt Lake City, Utah. When the express companies were consolidated in 1918, Mr. Hammell was appointed assistant general agent at Denver, Colo., for the American Railway Express Company and in April of the following year he became general agent at El Paso, Tex. He was recalled to San Francisco in December, 1919, to serve as chief clerk to the vice-president and after serving in that position for nearly five years he was appointed acting superintendent at Great Falls, Mont., later becoming superintendent of the Montana division. Mr. Hammell was promoted to the position of superintendent of transportation and traffic at San Francisco in July, 1925, continuing in the same position when the express company was taken over by the Railway Express Agency.

TRAFFIC

E. L. Weaver, general agent at Chicago for the Pittsburgh & West Virginia, has been appointed to the newly-created position of general western agent, with the same headquarters. **R. J. McMillan,** a traffic representative at Cleveland, Ohio, has been advanced to general agent at Chicago to succeed Mr. Weaver.

F. K. Prosser, manager of the coal department of the Norfolk & Western, with headquarters at Roanoke, Va., has been appointed coal traffic manager, with the same headquarters, to succeed **Edward S. Moore,** who died on February 6. **L. P. Harrell,** assistant manager of the coal department has been promoted to succeed Mr. Prosser and **Ralph L. Hawkins,** chief clerk to the coal traffic manager has been appointed assistant manager of the coal department to succeed Mr. Harrell. Mr. Hawkins will in turn be replaced by **Walter A. Light.**

Oscar W. Cox, freight traffic manager of the Norfolk & Western, with headquarters at Roanoke, Va., has been appointed general traffic manager, with the same headquarters, to succeed **G. F. Butler,** who has been appointed vice-president in charge of traffic. **F. H. Pitman,** general freight agent, has been appointed freight traffic manager at Roanoke and **Freeman W. Jones,** assistant general freight agent at Columbus, Ohio, has been appointed general freight agent in charge of solicitation at Roanoke, to succeed Mr. Pitman. **H. D. Wilkerson,** general agent, with headquarters at Pittsburgh, Pa., will succeed Mr. Jones as assistant general freight agent at Columbus. **S. S. Hosp,** commercial agent at Minneapolis, Minn., will replace Mr. Wilkerson as general agent at Pittsburgh.

MOTOR TRANSPORT

D. Wallace Fisher, who has been appointed superintendent of the Reading Transportation Company, highway subsidiary of the Reading, with headquarters at Philadelphia, Pa., as reported in the *Railway Age* of March 24, page 458, was born at Manheim, Pa., on November 29, 1893. He was graduated from Stevens Technical School at Lancaster, Pa., in 1910. After serving for several years as a tool maker for the Hamilton Watch Company, he was employed for two years as an automotive mechanic. In 1916 he entered the service of the Reading as a machinist in the locomotive shops at Reading, Pa.,

D. Wallace Fisher

later being transferred to the office of the mechanical engineer as draftsman. In 1919 Mr. Fisher was appointed motive power inspector, being advanced to the position of assistant mechanical engineer in 1922. Mr. Fisher was appointed assistant superintendent of the Reading Transportation Company in April, 1928, and served in that position continuously until his recent promotion.

OBITUARY

Edward R. Ferry, general agent for the Illinois Central at New Orleans, La., died on March 13 at the age of 62 years.

C. E. Taylor, superintendent of the Chicago Terminals of the Atchison, Topeka & Santa Fe, died on March 22 at Chicago, of pneumonia.

J. H. Thorup, who retired in 1926 as local storekeeper of the Chicago & North Western at Chicago, died on March 22 at Chicago, at the age of 77 years.

Reuben L. Ward, general agent for the Chicago, Rock Island & Pacific at Indianapolis, Ind., died on March 6 after a long illness.

Hugh B. Cutter, auditor of freight accounts of the Louisville & Nashville, with headquarters at Louisville, Ky., died in that city on March 19 after a short illness. Mr. Cutter had been in the service of the L. & N. since August, 1888, and had served as auditor of freight accounts since March, 1920.

Edward T. Nichols, retired vice-president of the Great Northern, whose death on March 20 was reported in the *Railway Age* of March 24, was born at Pensacola, Fla., in August, 1852. He was educated at Brooklyn Polytechnic Institute and St.

(*Continued on page 490*)

Annual Report

Canadian Pacific Railway Company

FIFTY-THIRD ANNUAL REPORT

OF THE

DIRECTORS OF THE CANADIAN PACIFIC RAILWAY COMPANY,
YEAR ENDED DECEMBER 31, 1933.

To the Shareholders:

The accounts of the Company for the year ended December 31, 1933, show the following results:—

Gross Earnings	$114,269,688.16
Working Expenses (including all taxes)	93,407,582.39
Net Earnings	$20,862,105.77
*Special Income	6,222,481.14
	$27,084,586.91
Deduct Fixed Charges	24,388,614.66
Surplus	$2,695,972.25
Pensions	1,438,811.48
Balance transferred to Profit & Loss and Surplus Revenue Account	$1,257,160.77

Profit & Loss and Surplus Revenue Account

Surplus Revenue December 31, 1932		$167,069,695.48
Balance of Income for the year ended December 31, 1933		1,257,160.77
		$168,326,856.25
DEDUCT:		
*Provision for depreciation of Ocean and Coastal Steamships	$3,854,481.41	
Exchange in connection with retirement of securities (net)	111,477.88	
Balance of unemployment relief expenditure, carried as deferred charges December 31, 1932	6,327,616.37	
Loss on lines abandoned, property retired and not replaced, and miscellaneous debits	2,039,600.73	
Provision for losses in respect of investment in lines in the United States controlled through stock ownership	4,000,000.00	16,333,176.39
Surplus Revenue December 31, 1933, as per Balance Sheet		$151,993,679.86

*Special Income is before depreciation on Ocean and Coastal Steamships. In 1932 provision of $500,000 for such depreciation was deducted from Special Income.

Earnings and Expenses

While the year 1933 witnessed a further decline in rail gross earnings, there was a betterment in the net of $772,121 in comparison with the preceding year.

The gross earnings were $9,667,025 less than in 1932. Passenger traffic earnings declined $2,437,535, decreases being recorded in each month throughout the year except in December. Freight earnings declined $6,196,147, mainly due to reduced grain traffic, there having been a decrease of 34% in such traffic during the period August 1, the beginning of the crop year, to December 31, as compared with the corresponding period in 1932.

The working expenses, including taxes, were $10,439,146 less than in 1932. Of this amount $2,182,290 was in maintenance expenses, and $6,987,492 in transportation expenses. The ratio of transportation expenses to revenue improved from 40.8% in 1932 to 38.2% in 1933. During the year the average freight train loading increased subsantially, the gross tons per freight train mile being 1,426 in 1932 and 1,515 in 1933. The fuel consumption improved from 114 lbs. per 1,000 gross ton miles in 1932 to 112 lbs. in 1933.

After protracted negotiations and proceedings before Boards of Conciliation under the Industrial Disputes Investigation Act, further revisions of wages were made, so that at the close of the year, except in respect of a group of employees with whom negotiations were unfinished, a deduction of fifteen per cent from basic rates of pay of all classes of officers and employees was in effect, and in the case of the higher positions in the service twenty per cent. The deduction of twenty-five per cent from Directors' fees was continued, and the deduction from the President's salary increased at his request to forty per cent.

The working expenses for the year, including all taxes, amounted to 81.74% of the gross earnings, as compared with 83.79% in 1932. Excluding taxes, the ratio of working expenses to gross earnings was 78.12% as against 80.42% in 1932.

Your Directors wish to again pay tribute to the spirit of loyalty displayed by all officers and employees in the fulfilment of their duties during the past year. Reductions of pay and trying conditions have in no way impaired their efforts to give efficient service and maintain the reputation of the Company.

Special Income

Special Income for the year improved somewhat over 1932. Net revenue from Miscellaneous Investments included a stock dividend of ten per cent and a cash dividend of six per cent from the Consolidated Mining and Smelting Company. Due to the changes in the price of Sterling and U. S. Funds, the amount to the credit of Exchange was $1,071,525 less than in 1932. The net earnings before depreciation of your Ocean and Coastal Steamship Lines reflect a moderate increase over the preceding year. There was a decrease of $75,509 in gross earnings of the Communications Department, but, as expenses were reduced $280,903, there was an increase in net earnings of $205,394. Gross earnings of Hotels decreased $380,930, and expenses $661,640, an improvement in the net results of $280,710. Other properties administered, the income from which is included under Special Income, have been most carefully managed and the favorable reversal in the trend of net results is encouraging.

Owing to the depression in all branches of the shipping industry, the "Empress of France," "Minnedosa," "Metagama," "Bolingbroke" and "Bothwell" were not commissioned during the year, and the last named two were sold. The "Empress of Australia," "Melita," "Montcalm," "Montrose" and "Duchess of Richmond" were laid up for varying periods, but all other vessels of the fleet were constantly employed. Your Directors are glad to be able to report that no serious accident to the vessels of your fleet took place during the year.

Land Sales

Sales of agricultural lands for the year were 67,100 acres for $716,925.41, an average of $10.68 per acre. Included in these areas were 2,619 acres of irrigated land which brought $44.80 per acre, the remainder averaging $9.30 per acre.

Accounts

An amount of $3,854,481 was appropriated from Surplus for steamship replacement, representing the full annual depreciation requirement of your Ocean and Coastal fleets for the year.

In view of the aggravated unemployment situation the Company kept its principal repair shops operating throughout the year on a restricted schedule. All expenditures incurred during the year have been taken up in the year's working expenses. Expenses incurred during former years for unemployment relief purposes, and treated as deferred charges, have been charged to Surplus, with a consequent increase in Reserve for Contingencies and Unadjusted Balances.

During the year the abandonment of nineteen miles of line between Bolton and Melville, and twenty-one miles between Burketon and Lindsay was completed. The necessary adjustments have been made in the Property Account.

The operating results of your controlled lines in the United States showed some improvement, but, as they were still operated at a loss, a further provision of $4,000,000 was made to provide against possible future writing down of the investments in these properties.

The investments of the Insurance Department have been included amongst the assets of the Company, and the Insurance Reserve included on the liability side of the Balance Sheet.

Dividends

Your Directors regret to announce that the results of the year's operations, coupled with the general situation, do not warrant the declaration of dividends on the Preference or Ordinary Stocks in respect of the year 1933. It may be stated, however, that the earnings of December, 1933, and January and February, 1934, show a gratifying improvement over those of the same period a year ago, and that the present indications point to the probability of a continued improvement.

Pensions

The amounts appropriated for pensions during the last few years have been less than the actual payments made, so that it has been necessary to draw upon the balance in the Pension Fund accumulated during previous years. There has been charged against this year's results $1,438,811 which, together with the balance remaining in the Fund, was sufficient to meet the pension payments. It has been decided that, effective January 1, 1934, pension payments will be charged currently to working expenses, thus conforming to the general practice of Railways in this respect.

During the year 325 employees were pensioned. The total number on the pension roll at December 31, 1933, was 2,350.

Under 60 years of age	53
Between 60 and 65	208
Between 65 and 70	876
Over 70 years of age	1,213
Total	2,350

Capital Expenditures

In anticipation of your confirmation, your Directors authorized Capital Appropriations, in addition to those approved at the last Annual Meeting, aggregating for the year 1933, $718,368. During the year 1933 the retirement of property exceeded the additions and betterments, with the result that investment in railway, rolling stock equipment, lake and river steamers and hotels decreased $862,102. Approval is requested for capital expenditures during the present year of $2,625,957. Particulars of the principal items are:—

Replacement and enlargement of structures in permanent form	$82,364
Additions and betterments to stations, freight sheds, coaling and watering facilities and enginehouses	16,637
Ties, tie plates, rail anchors, ballasting, ditching and miscellaneous roadway betterments	1,886,150
Replacement of rail in main and branch line tracks with heavier section	11,558
Additional terminal and side track accommodation	7,914
Additions and betterments to communication system	155,504
Installation of automatic signals	14,300
British Columbia Coast Steamships	4,970
British Columbia Lake and River Steamers	13,500
Additions and betterments to equipment	368,060

The prospective retirements of property in 1934 will, it is anticipated, again exceed the capital expenditures for which approval is now requested.

Finance

Owing to continued unfavorable conditions of the financial market, no Capital Stock or Consolidated Debenture Stock was sold during the year. For the purpose of retiring obligations maturing in 1933 and 1934, your Company borrowed from Canadian Banks the sum of $60,000,000, repayable in five years with interest at five per cent per annum, secured by pledge of Consolidated Debenture Stock to the aggregate principal amount of $100,000,000, and by guarantee of the Dominion Government. Out of the loan, obligations maturing during the year, amounting to $38,750,000, were redeemed, and $1,411,100 of securities maturing in 1934 were acquired.

Minneapolis, St. Paul and Sault Ste. Marie Railway

Prolonged drought in the territory traversed by the railway greatly reduced the volume of grain handled, but improvement in other lines of traffic and reduction in expenses enabled the company to show a decrease in net income deficit of approximately $700,000 as compared with the preceding year. In pursuance of its guarantee obligations, and to preserve your interests in the property, your Company advanced to the Soo Line $5,493,866, of which $916,581 was repaid during the year.

Agreement

Your confirmation and approval will be asked of an Agreement, to be retroactive to January 1, 1930, between your Company of the one part and His Majesty King George V, in the right of the Dominion of Canada, and The Commissioners of the Transcontinental Railway of the other part, amending and supplementing the Agreement between the parties dated January 1, 1915, in reference to the joint use by the Transcontinental of your Company's passenger and freight facilities at the City of Quebec.

Co-operation with Canadian National Railway Company

The Bill providing for co-operative measures between your Company and the Canadian National Railway Company with a

CANADIAN PACIFIC RAILWAY COMPANY
GENERAL BALANCE SHEET, DECEMBER 31, 1933

ASSETS

Property Investment:		
Railway, Rolling Stock Equipment, Lake and River Steamers and Hotels	$870,926,969.02	
Ocean and Coastal Steamships	116,436,893.17	
Acquired Securities (Cost)	181,746,612.77	
		$1,169,110,474.96
Advances to Controlled Properties and Other Investments		18,824,889.63
Investments and Available Resources:		
Dominion, Provincial & Municipal Securities (Cost)	$3,103,439.24	
Mortgages Collectible and Loans & Advances to Settlers	3,366,093.31	
Miscellaneous Investments, (Cost)	34,102,748.03	
Insurance Fund Investments	8,233,882.51	
Deferred Payments on Lands and Townsites	48,650,457.27	
Assets in Lands and Properties	54,257,484.00	
		151,714,104.36
Working Assets:		
Material and Supplies on Hand	$17,183,809.05	
Insurance Prepaid	209,225.10	
Agents' and Conductors' Balances	4,878,040.04	
Net Traffic Balances	491,820.36	
Accounts due from Dominion, Imperial and United States Governments	629,084.29	
Miscellaneous Accounts Receivable	7,384,694.21	
Cash on Hand	29,498,784.26	
		60,275,457.31
		$1,399,924,926.26

LIABILITIES

Capital Stock:		
Ordinary Stock	$335,000,000.00	
Four Per Cent. Preference Stock	137,256,921.12	
		$472,256,921.12
Four Per Cent Consolidated Debenture Stock	$515,911,548.74	
Less: Pledged as collateral to bonds and notes	224,500,000.00	
		291,411,548.74
Bonds and Notes	$205,409,700.00	
Less: Securities deposited with Trustee of 5% Equipment Trust	4,550,313.78	
		200,859,386.22
Twenty Year 4½% Sinking Fund Secured Note Certificates (1944)	$30,000,000.00	
Less: Purchased by Trustee and cancelled	8,685,800.00	
	$21,314,200.00	
Less: Amount held by Trustee	134,706.96	
		21,179,493.04
Current:		
Audited Vouchers	$4,245,966.56	
Pay Rolls	2,520,159.19	
Miscellaneous Accounts Payable	2,157,457.07	
		8,923,582.82
Accrued Fixed Charges		1,474,008.83
Deferred:		
Dominion Government Unemployment Relief	$2,447,222.71	
Miscellaneous	322,437.30	
		2,769,660.01
Reserves:		
For Equipment Replacement	$8,717,784.31	
For Steamship Replacement	31,513,584.95	
For Insurance	8,233,882.51	
For Contingencies and unadjusted balances	9,553,010.08	
For Investments	8,000,000.00	
		66,018,261.85
Premium on Capital Stock Sold (Less discount on bonds and notes)		66,993,894.72
Land Surplus		116,044,489.05
Surplus Revenue		151,993,679.86
		$1,399,924,926.26

L. B. UNWIN, *Comptroller.*

Auditors' Certificate:

We have examined the Books and Records of the Canadian Pacific Railway Company for the year ending December 31, 1933, and having compared the above Balance Sheet therewith, we certify that, in our opinion it is properly drawn up so as to show the true financial position of the Company at that date, and that the statements of Income and of Profit & Loss and Surplus Revenue correctly set forth the result of the year's operations.

PRICE, WATERHOUSE & CO.,
Chartered Accountants, (England).

Montreal, March 9, 1934.

view to mutual economies, to which reference was made at the last Annual Meeting, became law on July 1, 1933. During the year measures were agreed upon and put into effect, such as the pooling of train services between certain common points, and the consolidation of certain terminal facilities. None of these were of great magnitude, but they have proved mutually advantageous in the direction of economy. Many other and larger matters have been the subject of study and discussion, and your Directors believe that the new year will witness more important achievements in the same field.

Stock Holdings

The holdings of the Ordinary and Preference Stocks of the Company in December, 1933, were distributed as follows:—

	ORDINARY		PREFERENCE		Percentage of Ordinary and Preference combined
	No. of holders	Percentage of Stock	No. of holders	Percentage of Stock	
Canada	32,447	18.46	85	.46	13.13
United Kingdom and other British	21,327	48.05	27,659	97.83	62.79
United States	17,417	27.55	33	.58	19.57
Other Countries ..	4,637	5.94	201	1.13	4.51
	75,828		27,978		

Death of Hon. Frederick L. Beique, K.C.

It is with deep regret that the Directors have to report the loss sustained by the Company in the Death on September 12, 1933, of the Hon. Frederick L. Beique, K.C., who was a Director since 1917, and who was also a member of the Executive Committee of the Board.

The vacancy on the Executive Committee created by the death of Senator Beique has been filled by the appointment of Mr. William A. Black to that Committee.

Retiring Directors

The undermentioned Directors will retire from office at the approaching Annual Meeting. They are eligible for re-election:—

Sir Charles Gordon, G.B.E.
Mr. Ross H. McMaster
Rt. Hon. Reginald McKenna
Mr. James A. Richardson
Mr. W. J. Blake Wilson

For the Directors

E. W. Beatty,
President.

Montreal, March 12, 1934.

[Advertisement]

News (Railway Officers)

(*Continued from page 487*)

Paul's school, Concord, N. H., and entered railway service in January, 1876, as assistant secretary of the St. Paul & Pacific (port of Great Northern). He later served with the St. Paul, Minneapolis & Manitoba (also part of Great Northern) and in 1890, when the Great Northern was formed, Mr. Nichols became secretary and assistant treasurer of that company. In 1901 he was elected third vice-president and secretary, later being appointed vice-president and assistant secretary, in which capacity he served until his retirement. Mr. Nichols was also a director of the Great Northern.

Edward S. Moore, coal traffic manager of the Norfolk & Western, with headquarters at Roanoke, Va., died in Norfolk on February 6 of a heart ailment. Mr. Moore was born at Newport, Pa., on September 28, 1880. He was educated in the public schools and entered railway service with the Norfolk & Western as messenger in 1895. Two years later he became stenographer in the office of the car service agent of the same road and in 1903 he became chief clerk to the superintendent of transportation at Roanoke. Mr. Moore was appointed superintendent of transportation in July, 1917, and in the latter part of 1926 he was further advanced to the position of general superintendent of transportation. He was appointed coal traffic manager of the road in July, 1931, when the freight traffic department of the road was partially reorganized, serving in that position until his death.

Edward S. Moore

William S. Martin, president of the Arkansas & Memphis Railway Bridge and Terminal Co., and a special representative of the St. Louis Southwestern, with headquarters at Memphis, Tenn., died suddenly at Memphis on March 21. Mr. Martin was born in December, 1863, at Keokuk, Iowa, and entered railway service in 1878 as a clerk and telegraph operator on the Missouri, Iowa & Nebraska Railroad (now part of the C. B. & Q.). During the next 11 years he served in various positions with this company, the Western Union Telegraph Company, the Wabash and the Louisville, Evansville & St. Louis (now part of the Southern). On July 1, 1889, Mr. Martin was appointed a trainmaster on the Louisville & Nashville and was soon promoted to superintendent, serving in this position at various points until September 1, 1900. On that date Mr. Martin was appointed general superintendent of the Denver & Rio Grande, going with the Southern as a division superintendent two years later. On January 1, 1903, he became general manager of the Mexican International, returning to the D. & R. G. on June 1, 1907, as assistant general manager. In August, 1913, he was promoted to general manager and in June, 1915, he was elected president of the Union Railway, of which road he acted as general superintendent during federal control of the railroads. Following the termination of federal control, Mr. Martin again assumed the presidency of the Union Railway. Shortly thereafter he was appointed a special representative of the Cotton Belt and president of the Arkansas & Memphis Railway Bridge and Terminal Co., holding these positions until his death.

Francis X. Milholland, assistant to the senior vice-president of the Baltimore & Ohio, with headquarters at Baltimore, Md., died at Mercy hospital in that city on March 24, after three weeks' illness. Mr. Milholland was born in Baltimore on August 21, 1880. He was graduated from Loyola college, Baltimore, and studied law at the Baltimore Law University, receiving the degrees of A. B. (1899), A. M. (1900), and LL.B. (1910). He entered the service of the Baltimore & Ohio in 1900 as stenographer, serving in that capacity and various other minor positions until 1904, when he became a member of the president's office staff. In December of the same year he was appointed secretary to the assistant to the president, continuing in that position until 1911, when he became chief clerk to the senior vice-president. Mr. Milholland was appointed assistant to the senior vice-president in 1920, in which capacity he also handled public relations matters for the road. Mr. Milholland also planned and directed the B. & O.'s exhibit at A Century of Progress at Chicago last year.

Francis X. Milholland

Table of Operating Statistics of Railways begins on next left-hand page

Operating Statistics of Large Steam Railways—Selected Items for the Month of January, 1934,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross Excluding locomotives and tenders	Ton-miles (thousands): Net Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany 1934	402	140,902	145,861	9,247	3,221	65.9	170,970	58,214	65	37	36.3	14
1933	402	112,469	116,466	7,375	2,771	67.9	141,019	46,661	60	52	46.3	13
Boston & Maine 1934	2,059	286,798	324,884	30,837	8,947	64.2	519,459	193,237	141	145	50.7	13
1933	2,059	234,047	261,298	19,410	7,171	66.3	391,768	137,465	129	161	55.5	26
N. Y., New H. & Hartf. 1934	2,044	362,069	441,690	24,377	10,889	62.1	631,366	238,213	204	156	43.4	11
1933	2,045	304,116	363,375	18,583	9,000	64.9	486,653	174,109	217	135	38.3	27
Great Lakes Region:												
Delaware & Hudson 1934	848	228,796	307,455	35,137	6,971	59.0	468,589	219,077	247	32	11.6	133
1933	848	183,192	240,246	23,801	5,259	59.8	335,875	150,008	255	28	10.0	165
Del., Lack. & Western 1934	998	360,944	398,586	51,159	10,419	62.5	634,551	249,083	194	63	24.6	40
1933	998	302,824	330,309	39,745	9,014	65.4	519,680	201,270	209	56	21.2	68
Erie (incl. Chi. & Erie) 1934	2,315	625,193	656,789	50,489	24,766	62.2	1,539,009	593,460	321	172	34.8	98
1933	2,316	565,500	584,705	41,833	21,858	60.8	1,376,171	514,318	307	185	37.7	114
Grand Trunk Western 1934	1,008	203,679	206,401	3,560	4,965	60.6	302,194	104,717	68	84	55.4	2
1933	1,003	181,068	183,147	2,055	4,533	59.6	271,346	89,235	85	66	43.8	21
Lehigh Valley 1934	1,335	398,923	419,168	41,419	11,246	61.4	721,593	297,922	178	138	43.7	14
1933	1,344	336,210	348,821	29,902	9,609	63.1	575,866	222,166	174	143	45.0	21
Michigan Central 1934	1,957	376,436	377,938	15,441	11,617	59.7	696,652	231,885	137	51	27.0	35
1933	1,965	339,834	340,116	9,634	10,037	59.3	598,171	194,816	129	75	36.9	40
New York Central 1934	6,411	1,454,558	1,554,261	114,487	50,628	58.0	3,313,429	1,364,532	582	568	49.4	32
1933	6,428	1,344,022	1,428,267	88,059	46,173	58.5	2,959,689	1,191,457	576	660	53.4	32
New York, Chi. & St. L. 1934	1,660	481,825	487,371	5,308	13,922	59.5	856,884	307,810	130	56	30.0	23
1933	1,661	419,923	426,516	4,508	12,208	61.2	718,915	251,478	127	115	47.4	31
Pere Marquette 1934	2,218	349,509	363,297	3,393	8,333	58.5	536,633	203,236	116	47	28.9	17
1933	2,286	305,742	314,137	2,455	6,592	56.1	447,337	170,349	123	50	28.9	21
Pitts. & Lake Erie 1934	234	58,455	60,619	1,098	2,190	53.7	192,004	102,149	31	39	56.3	4
1933	236	46,170	47,448	825	1,796	54.0	153,381	80,987	29	58	66.4	10
Wabash 1934	2,445	516,715	523,020	9,638	14,991	61.4	884,652	289,712	166	172	50.8	64
1933	2,453	462,175	469,548	8,972	13,143	62.6	747,511	239,671	183	161	46.7	28
Central Eastern Region:												
Baltimore & Ohio 1934	6,263	1,267,226	1,557,950	173,200	35,188	58.2	2,460,302	1,082,485	675	659	49.4	80
1933	6,283	1,165,824	1,366,234	130,036	30,560	58.1	2,092,448	889,040	788	562	41.6	233
Big Four Lines 1934	2,655	567,572	589,694	23,908	15,974	59.9	1,042,199	457,149	197	155	44.0	23
1933	2,660	541,221	561,200	16,743	14,882	59.6	987,234	441,075	248	181	42.1	11
Central of New Jersey 1934	690	146,655	163,611	28,474	4,638	55.7	341,538	164,451	95	77	44.8	31
1933	692	131,644	143,041	21,141	3,870	55.5	278,009	129,950	114	64	36.1	58
Chicago & Eastern Ill. 1934	939	173,572	174,092	2,697	3,547	57.2	249,459	104,591	63	109	63.2	16
1933	939	162,848	163,123	3,071	3,176	61.2	214,514	94,598	67	96	59.0	25
Elgin, Joliet & Eastern 1934	446	76,415	77,811	1,477	1,588	56.9	126,999	61,171	65	24	26.5	14
1933	447	63,453	64,000	1,550	1,335	56.0	108,392	51,260	76	13	14.8	32
Long Island 1934	396	31,007	31,876	14,938	304	53.2	23,307	9,578	33	24	42.5	..
1933	396	27,324	28,256	12,897	283	53.5	21,548	8,667	34	12	27.2	5
Pennsylvania System 1934	10,088	2,601,440	2,908,513	308,944	83,858	59.7	5,716,513	2,501,998	1,526	907	37.3	412
1933	10,528	2,351,849	2,606,500	251,787	73,838	59.9	4,971,046	2,129,419	1,786	724	28.8	739
Reading 1934	1,454	444,771	484,686	50,522	11,682	56.5	902,685	438,012	264	119	31.1	69
1933	1,454	372,988	399,759	36,882	9,228	56.4	682,430	316,824	295	93	23.9	129
Pocahontas Region:												
Chesapeake & Ohio 1934	3,112	777,920	825,350	35,240	31,078	54.0	2,658,831	1,409,899	453	121	21.0	145
1933	3,136	746,570	782,378	25,439	28,908	54.5	2,463,667	1,324,978	543	141	20.7	238
Norfolk & Western 1934	2,164	551,166	575,121	28,226	19,911	58.2	1,652,353	830,653	416	54	11.5	196
1933	2,223	512,448	532,502	24,880	17,992	58.6	1,474,675	776,718	415	65	13.5	187
Southern Region:												
Atlantic Coast Line 1934	5,145	602,316	604,085	6,993	12,020	59.4	670,824	227,739	345	134	27.9	102
1933	5,144	562,455	563,980	7,896	11,122	58.3	604,290	185,716	375	102	21.3	120
Central of Georgia 1934	1,886	199,654	200,257	3,074	4,287	68.8	232,776	86,846	102	38	26.8	..
1933	1,900	180,825	181,550	2,634	3,609	66.7	199,429	73,018	85	55	38.9	..
Illinois Central (incl. 1934	6,640	1,291,739	1,307,750	24,067	28,255	58.9	1,901,860	769,851	597	331	35.7	10
Y. & M. V.) 1933	6,643	1,191,360	1,205,973	20,466	26,236	59.3	1,751,941	707,778	645	296	31.5	28
Louisville & Nashville 1934	5,067	935,760	984,808	23,343	19,597	59.0	1,353,815	630,957	332	303	47.7	31
1933	5,166	824,987	872,862	23,665	16,836	57.1	1,177,871	533,612	343	365	51.6	83
Seaboard Air Line 1934	4,298	505,613	516,250	4,710	11,666	61.4	704,069	238,236	208	81	28.0	6
1933	4,373	478,480	495,406	4,200	10,967	56.6	688,267	212,923	241	48	16.6	40
Southern 1934	6,599	1,068,923	1,083,174	18,881	23,564	65.3	1,325,027	506,929	639	275	30.1	155
1933	6,602	1,009,446	1,020,896	17,926	22,382	65.4	1,230,250	455,113	738	170	18.7	254
Northwestern Region:												
Chi. & North Western 1934	8,443	946,890	996,330	21,829	22,360	61.2	1,374,744	491,930	577	240	29.4	154
1933	8,443	794,338	832,590	17,688	18,103	62.3	1,078,687	362,065	610	219	26.4	243
Chicago Great Western 1934	1,463	210,715	213,878	16,693	6,078	59.2	378,686	130,142	64	36	36.4	2
1933	1,463	183,007	183,211	13,659	5,000	57.3	314,546	106,658	63	39	38.0	3
Chi., Milw., St. P. & Pac. 1934	11,193	1,126,123	1,194,534	54,488	27,510	59.6	1,778,496	713,145	576	304	34.6	218
1933	11,234	1,010,078	1,064,250	45,571	23,378	60.1	1,485,804	581,682	740	168	18.5	386
Chi., St. P., Minneap. & 1934	1,653	208,068	215,361	10,342	4,293	63.6	265,175	89,196	125	33	21.2	58
Om. 1933	1,714	182,061	185,800	8,094	3,264	67.0	188,621	74,423	136	34	20.0	77
Great Northern 1934	8,336	596,582	601,376	18,261	16,008	65.0	1,004,451	414,849	440	165	27.3	115
1933	8,429	539,931	543,116	13,266	13,426	64.6	827,175	338,285	476	121	20.2	165
Minneap., St. P. & S. St. 1934	4,281	331,605	335,412	2,407	6,452	63.7	378,168	154,288	118	44	26.9	9
M. 1933	4,314	320,286	323,160	873	5,476	66.2	309,557	127,027	135	42	23.8	17
Northern Pacific 1934	6,414	502,504	543,354	35,327	13,878	67.0	819,531	348,492	368	149	28.8	43
1933	6,400	437,373	457,191	24,320	10,716	67.5	622,108	253,459	388	136	26.0	99
Oreg.-Wash. R. R. & Nav. 1934	2,111	148,739	154,019	9,218	3,495	63.3	214,202	83,963	71	49	40.8	11
1933	2,179	117,808	121,400	6,488	2,614	68.9	146,898	56,531	80	42	34.2	32
Central Western Region:												
Alton 1934	923	173,857	176,519	1,827	3,392	60.7	215,818	70,853	37	56	59.8	3
1933	952	168,345	168,765	973	3,188	56.5	210,267	68,779	58	44	43.5	12
Atch., Top. & S. Fe (incl. 1934	11,425	1,206,567	1,247,129	43,065	30,116	63.3	1,795,828	603,300	618	307	33.2	229
P. & S. F.) 1933	11,612	1,166,264	1,232,874	47,163	28,633	61.5	1,726,285	561,364	665	272	29.0	275
Chi., Burl. & Quincy 1934	9,097	1,109,668	1,144,976	33,609	26,966	59.6	1,646,031	674,604	429	126	22.7	8
1933	9,157	977,246	995,636	20,497	22,205	59.7	1,335,128	535,976	473	137	22.5	77
Chi., Rock I. & Pac. (incl. 1934	8,332	992,692	1,008,318	6,197	21,190	61.1	1,279,100	460,989	442	149	25.2	112
Chi., Rock I. & Gulf) 1933	8,333	950,537	964,726	5,554	19,750	58.5	1,209,574	418,587	472	144	23.4	134
Denver & R. G. Wn. 1934	2,469	186,680	205,477	22,248	5,167	64.3	310,568	123,445	177	54	23.4	36
1933	2,514	157,747	172,759	18,911	4,001	61.5	247,854	96,244	187	45	19.4	56
Los Angeles & Salt Lake. 1934	1,232	165,832	188,637	25,961	4,705	61.4	279,138	100,581	66	30	30.8	6
1933	1,240	145,304	162,969	21,886	4,235	65.0	238,814	84,698	80	26	24.6	16
Oregon Short Line 1934	2,460	249,976	258,518	14,668	6,452	60.2	402,688	141,357	133	49	26.9	33
1933	2,467	206,382	218,817	16,702	5,012	64.5	300,302	114,534	140	44	23.7	66
Southern Pacific—Pacific 1934	8,718	949,721	1,011,132	100,980	29,270	64.5	1,736,821	573,445	506	349	40.8	186
Lines 1933	8,878	838,612	884,846	73,700	23,030	63.1	1,381,332	435,554	516	358	40.9	217
Union Pacific 1934	3,768	812,102	830,803	35,896	27,153	60.7	1,645,754	549,532	317	116	26.9	99
1933	3,768	606,615	617,993	21,932	19,223	65.3	1,090,060	383,335	364	105	22.4	205
Southwestern Region:												
Gulf, Colo. & S. Fe 1934	1,906	174,358	176,152	3,064	3,894	64.2	240,047	96,345	88	36	29.2	21
1933	1,943	173,569	175,815	2,589	4,063	63.2	247,663	96,805	92	30	24.8	31
Mo.-Kans.-Texas Lines 1934	3,282	366,251	368,501	5,131	9,096	60.1	555,293	198,125	159	74	31.6	71
1933	3,282	325,782	326,960	4,356	7,638	60.5	450,624	155,180	153	76	33.2	77
Missouri Pacific 1934	7,333	1,071,055	1,095,110	24,398	27,528	60.1	1,764,259	644,334	407	161	28.4	133
1933	7,385	968,933	994,119	23,024	23,860	60.6	1,493,396	544,538	442	143	24.4	177
St. Louis-San Francisco 1934	5,173	617,674	623,020	6,559	13,217	61.6	815,436	319,593	400	81	16.8	160
1933	5,193	556,046	558,808	6,227	11,365	60.4	705,730	275,102	407	70	14.7	158
St. Louis Southwestern 1934	1,872	212,851	228,586	2,872	5,322	62.5	306,725	98,699	98	36	26.6	12
Lines 1933	1,902	191,684	195,353	2,668	4,427	65.5	245,431	80,176	107	24	18.0	31
Texas & New Orleans 1934	4,464	483,803	484,364	4,978	10,395	61.8	622,084	204,381	222	83	27.3	52
1933	4,568	419,957	420,432	5,619	8,991	67.2	498,650	167,804	221	86	27.9	55
Texas & Pacific 1934	1,946	242,171	242,171	1,768	6,975	59.0	437,654	144,407	165	70	29.7	88
1933	1,946	215,792	215,792	1,123	6,067	61.8	361,129	120,056	187	60	24.2	88

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

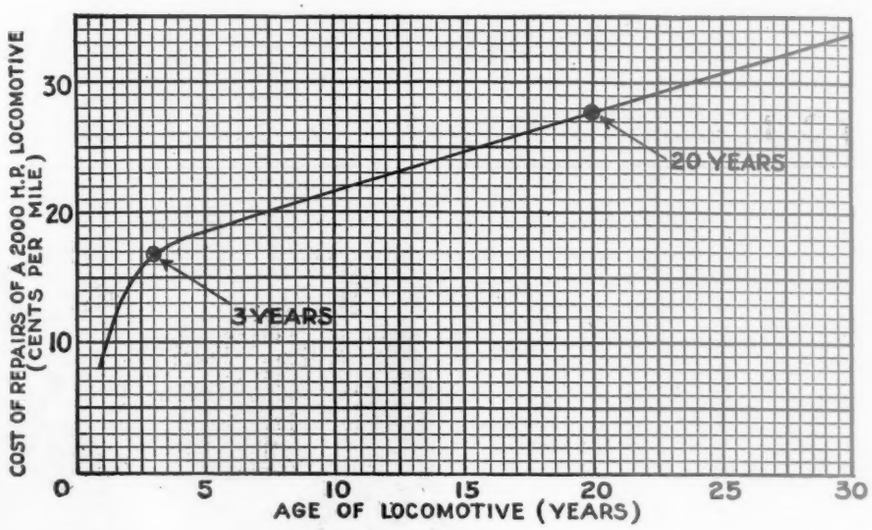
Compared with January, 1933, for Roads with Annual Operating Revenues Above $25,000,000

Region, road and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany 1934	3,351	3,721	7,072	25.6	20,606	1,213	413	18.1	266	22.3	4,675	173	48.9
1933	4,672	2,554	7,226	37.7	20,644	1,254	415	16.8	208	18.2	3,747	174	35.7
Boston & Maine 1934	8,945	7,877	16,822	15.2	25,318	1,811	674	21.6	371	26.7	3,028	119	40.1
1933	9,815	5,867	15,682	15.7	23,637	1,668	586	19.2	282	22.2	2,147	116	31.2
N. Y., New H. & Hartf. 1934	15,572	11,306	26,878	11.6	25,750	1,744	658	21.9	286	21.1	3,759	120	41.8
1933	17,070	8,450	25,520	8.5	24,556	1,600	573	19.3	220	17.5	2,746	124	35.0
Great Lakes Region:													
Delaware & Hudson 1934	10,591	2,765	13,356	4.5	25,816	2,048	958	31.4	529	28.5	8,331	122	39.6
1933	11,996	1,751	13,747	3.8	25,497	1,833	819	28.5	352	20.6	5,706	131	30.1
Del., Lack. & Western 1934	16,521	4,468	20,989	11.1	25,567	1,758	690	23.9	383	25.6	8,050	167	56.5
1933	19,362	3,324	22,686	10.4	25,610	1,716	665	22.3	286	19.6	6,505	152	45.1
Erie (incl. Chi. & Erie) 1934	32,772	12,085	44,857	5.8	38,355	2,462	949	24.0	427	28.7	8,268	113	46.3
1933	36,076	9,885	45,961	5.6	38,021	2,434	909	23.5	361	25.2	7,163	108	41.1
Grand Trunk Western 1934	5,790	7,891	13,681	18.8	27,520	1,484	514	21.1	247	19.3	3,350	115	44.5
1933	5,643	7,952	13,595	16.9	26,076	1,499	493	19.7	212	18.0	2,871	111	39.4
Lehigh Valley 1934	17,920	5,993	23,913	21.5	30,999	1,809	747	26.5	402	24.7	7,200	151	46.9
1933	20,071	4,301	24,372	18.4	30,103	1,713	661	23.1	294	20.1	5,333	154	38.5
Michigan Central 1934	21,471	19,126	40,597	14.2	34,413	1,851	616	20.0	184	15.5	3,822	105	67.7
1933	25,570	17,319	42,889	9.8	32,110	1,760	573	19.4	147	12.7	3,198	125	55.3
New York Central 1934	64,853	56,054	120,907	25.0	35,318	2,278	938	27.0	364	23.3	6,866	112	46.8
1933	83,651	53,299	136,950	24.4	34,950	2,202	886	25.8	281	18.6	5,979	109	39.6
New York, Chi. & St. L. 1934	9,075	6,598	15,673	4.0	31,221	1,778	639	22.1	634	48.2	5,981	110	85.4
1933	16,127	5,638	21,765	15.4	30,622	1,712	599	20.6	373	29.6	4,885	110	57.5
Pere Marquette 1934	13,369	5,181	18,550	2.8	26,431	1,535	581	24.4	353	24.8	2,956	102	72.4
1933	13,598	4,538	18,136	2.8	25,782	1,463	557	25.8	303	20.9	2,403	104	59.0
Pitts. & Lake Erie 1934	16,713	10,469	27,182	32.1	45,923	3,285	1,747	46.6	121	4.8	14,101	110	28.4
1933	17,675	6,664	24,339	27.2	48,832	3,322	1,754	45.1	107	4.4	11,091	126	17.8
Wabash 1934	15,150	7,880	23,030	3.4	34,815	1,712	561	19.3	406	34.2	3,823	125	50.8
1933	19,828	6,882	26,710	10.0	33,437	1,617	519	18.2	289	25.4	3,152	123	44.9
Central Eastern Region:													
Baltimore & Ohio 1934	83,386	17,486	100,872	18.8	24,844	1,941	854	30.8	346	19.3	5,576	170	41.9
1933	98,123	14,191	112,314	13.7	24,555	1,795	763	29.1	255	15.1	4,565	163	35.8
Big Four Lines 1934	18,161	22,282	40,443	15.5	31,671	1,836	805	28.6	365	21.3	5,555	126	56.2
1933	21,218	18,033	39,251	19.0	32,283	1,824	815	29.6	362	20.5	5,349	121	43.5
Central of New Jersey 1934	16,714	7,222	23,936	35.3	27,637	2,329	1,121	35.5	222	11.2	7,689	144	36.0
1933	18,150	5,703	23,853	21.5	28,156	2,112	987	33.6	176	9.4	6,058	131	29.8
Chicago & Eastern Ill. 1934	5,595	2,398	7,993	23.4	25,372	1,437	603	29.5	422	25.0	3,594	136	33.2
1933	6,158	1,862	8,020	17.4	22,886	1,317	581	29.8	380	20.9	3,250	133	32.8
Elgin, Joliet & Eastern **1934**	9,496	4,082	13,578	18.7	14,887	1,662	801	38.5	145	6.6	4,424	139	28.7
1933	9,986	3,637	13,623	15.4	15,327	1,708	808	38.4	121	5.6	3,699	133	23.8
Long Island 1934	778	3,247	4,025	2.0	5,874	752	309	31.5	77	4.6	780	302	26.5
1933	794	3,073	3,867	1.3	5,641	789	317	30.6	72	4.4	706	323	28.9
Pennsylvania System 1934	242,732	42,575	285,307	12.6	31,401	2,197	962	29.8	283	15.9	8,001	140	42.7
1933	251,498	39,454	290,952	9.0	31,163	2,114	905	28.8	236	13.7	6,525	138	36.7
Reading 1934	35,333	8,112	43,445	19.2	24,518	2,030	985	37.5	325	15.4	9,720	158	45.1
1933	40,256	7,054	47,310	15.1	23,468	1,830	849	34.3	216	11.2	7,029	159	36.3
Pocahontas Region:													
Chesapeake & Ohio 1934	43,080	7,543	50,623	1.8	46,331	3,418	1,812	45.4	898	36.7	14,616	88	48.4
1933	46,502	6,283	52,785	1.5	46,064	3,300	1,775	45.8	810	32.4	13,631	88	38.1
Norfolk & Western 1934	39,482	3,693	43,175	3.4	44,322	2,998	1,507	41.7	621	25.5	12,382	117	41.4
1933	41,279	3,813	45,092	2.9	42,570	2,878	1,516	43.2	556	22.0	11,269	120	37.0
Southern Region:													
Atlantic Coast Line 1934	27,487	6,125	33,612	24.7	19,312	1,114	378	18.9	219	19.4	1,428	122	41.2
1933	29,294	6,299	35,593	14.3	19,700	1,074	330	16.7	168	17.3	1,165	120	38.7
Central of Georgia 1934	7,570	2,219	9,789	24.7	20,737	1,166	435	20.3	286	20.5	1,486	134	46.8
1933	7,683	1,492	9,175	22.1	19,987	1,103	404	20.2	257	19.0	1,240	133	42.4
Illinois Central (incl. 1934	53,221	12,461	65,682	39.4	24,623	1,472	596	27.2	378	23.5	3,740	151	46.3
Y. & M. V.) 1933	54,721	10,859	65,580	24.0	24,158	1,471	594	27.0	348	21.8	3,437	151	42.1
Louisville & Nashville 1934	48,664	6,623	55,287	28.2	22,287	1,447	674	32.2	368	19.4	4,016	149	51.2
1933	53,619	5,134	58,753	23.8	21,269	1,428	647	31.7	293	16.2	3,332	153	40.8
Seaboard Air Line 1934	12,063	5,371	17,434	6.0	22,673	1,393	471	20.4	441	35.1	1,788	126	58.1
1933	13,879	5,284	19,163	4.3	23,541	1,438	445	19.4	358	32.6	1,571	124	55.8
Southern 1934	32,008	14,870	46,878	18.7	20,200	1,240	474	21.5	349	24.8	2,478	160	38.9
1933	28,982	24,804	53,786	18.2	20,123	1,219	451	20.3	273	20.5	2,224	158	36.9
Northwestern Region:													
Chi. & North Western 1934	44,022	17,136	61,158	9.2	22,277	1,452	520	22.0	259	19.2	1,880	144	40.1
1933	47,281	16,813	64,094	8.6	21,116	1,358	456	20.0	182	14.6	1,383	145	33.1
Chicago Great Western 1934	3,399	2,643	6,042	6.3	32,450	1,797	618	21.4	695	54.8	2,870	152	74.5
1933	4,658	2,337	6,995	13.5	30,515	1,719	583	21.3	492	40.3	2,351	150	62.8
Chi., Milw., St. P. & Pac. 1934	58,982	13,802	72,784	4.4	24,179	1,579	633	25.9	316	20.5	2,055	134	45.8
1933	62,420	12,497	74,917	3.2	23,234	1,471	576	24.9	250	16.7	1,670	136	39.4
Chi., St. P., Minneap. & 1934	2,381	7,110	9,491	10.6	18,711	1,274	429	20.8	303	23.0	1,741	129	46.0
Om. 1933	2,257	6,578	8,835	8.8	15,415	1,036	409	22.8	272	17.8	1,401	140	36.7
Great Northern 1934	43,603	9,371	52,974	6.2	24,729	1,684	695	25.9	253	15.0	1,605	147	33.0
1933	44,763	7,611	52,374	4.9	23,447	1,532	627	25.2	208	12.8	1,295	148	30.1
Minneap., St. P. & S. St. 1934	16,342	3,007	19,349	5.6	17,505	1,140	465	23.9	258	16.9	1,163	126	67.3
M. 1933	20,551	2,067	22,618	3.6	15,585	967	397	23.2	183	11.9	950	133	59.1
Northern Pacific 1934	41,972	4,199	46,171	11.6	23,973	1,631	694	25.1	243	14.5	1,753	170	36.1
1933	44,263	3,680	47,943	9.7	21,732	1,422	580	23.7	171	10.7	1,277	170	29.6
Oreg.-Wash. R. R. & Nav. 1934	8,598	1,743	10,341	4.9	21,672	1,440	564	24.0	262	17.2	1,283	147	43.7
1933	9,065	1,695	10,760	6.9	20,611	1,247	480	21.6	169	11.4	837	161	33.9
Central Western Region:													
Alton 1934	3,139	5,284	8,423	22.4	25,653	1,241	408	20.9	271	21.4	2,477	146	61.9
1933	5,020	3,926	8,946	15.0	25,718	1,249	409	21.6	248	20.3	2,332	142	53.7
Atch., Top. & S. Fe (incl. 1934	66,220	7,867	74,087	13.0	27,857	1,488	500	20.0	263	20.7	1,703	120	45.0
P. & S. F.) 1933	69,248	7,502	76,750	9.9	27,572	1,480	481	19.6	236	19.6	1,559	121	44.0
Chi., Burl. & Quincy 1934	39,819	11,590	51,409	7.9	26,054	1,483	608	25.0	423	28.4	2,392	133	68.5
1933	44,843	10,535	55,378	9.2	23,813	1,366	548	24.1	312	21.7	1,888	133	53.8
Chi., Rock I. & Pac. (incl. 1934	35,791	9,846	45,637	22.3	22,398	1,289	464	21.8	326	24.5	1,785	155	55.3
Chi., Rock I. & Gulf) 1933	42,347	9,613	51,960	16.1	21,994	1,273	440	21.2	260	21.0	1,620	152	50.8
Denver & R. G. Wn. 1934	13,798	2,823	16,621	5.4	24,452	1,664	661	23.9	240	15.6	1,613	181	31.9
1933	13,917	2,978	16,895	4.4	22,741	1,571	610	24.1	184	12.4	1,235	191	26.6
Los Angeles & Salt Lake 1934	4,733	1,070	5,803	11.0	29,223	1,683	607	21.4	559	42.6	2,634	145	72.3
1933	4,975	1,095	6,070	6.7	28,474	1,644	583	20.0	450	34.6	2,203	153	56.3
Oregon Short Line 1934	8,923	4,475	13,398	16.2	26,584	1,611	565	21.9	340	25.8	1,853	128	48.5
1933	10,210	3,345	13,555	9.6	23,363	1,455	555	22.9	273	18.5	1,498	134	41.3
Southern Pacific—Pacific 1934	38,899	21,363	60,262	12.3	29,741	1,829	604	19.6	307	24.3	2,122	115	42.0
Lines 1933	41,669	20,210	61,879	12.5	26,886	1,647	519	18.9	227	19.0	1,583	125	35.4
Union Pacific 1934	24,245	7,888	32,133	19.6	45,379	2,027	677	20.2	552	44.9	4,705	122	64.6
1933	25,474	6,689	32,163	20.3	32,759	1,797	632	19.9	384	29.5	3,282	124	44.0
Southwestern Region:													
Gulf, Colo. & S. Fe 1934	14,420	1,960	16,380	6.5	23,753	1,377	553	24.7	190	11.9	1,630	118	46.5
1933	14,209	1,819	16,028	5.5	24,200	1,427	558	23.8	195	12.9	1,607	118	47.0
Mo.-Kans.-Texas Lines 1934	9,305	2,626	11,931	8.8	26,908	1,516	541	21.8	536	40.9	1,947	99	51.8
1933	10,766	2,577	13,343	5.1	24,317	1,383	476	20.3	375	30.5	1,525	101	46.6
Missouri Pacific 1934	23,142	15,819	38,961	7.9	29,421	1,647	602	23.4	533	37.9	2,834	134	63.6
1933	27,421	13,750	41,171	14.7	27,091	1,541	562	22.8	427	30.9	2,379	141	56.1
St. Louis-San Francisco 1934	23,034	4,548	27,582	6.5	22,827	1,320	517	24.2	374	25.1	1,993	145	42.2
1933	27,241	3,914	31,155	5.2	21,412	1,269	495	24.2	285	19.5	1,709	145	38.2
St. Louis Southwestern 1934	4,690	2,573	7,263	9.5	25,241	1,441	464	18.5	438	37.8	1,701	109	55.9
Lines 1933	4,608	1,810	6,418	12.4	23,994	1,280	418	18.1	403	34.0	1,360	119	48.8
Texas & New Orleans 1934	8,558	10,939	19,497	5.8	22,131	1,286	422	19.7	338	27.8	1,477	100	51.8
1933	9,495	10,858	20,353	5.8	20,029	1,187	400	18.7	266	21.2	1,185	101	44.7
Texas & Pacific 1934	3,411	4,692	8,103	6.7	27,125	1,807	596	20.7	575	47.0	2,394	89	33.4
1933	5,943	3,902	9,845	8.6	26,277	1,674	556	19.8	393	32.2	1,991	86	28.3

WHY SHOULD RAILROADS BUY NEW LOCOMOTIVES?

II

(This is the second of a series of six advertisements answering the above query.)



The high percentage of locomotives more than 10 years old has another drawback besides obsolescence of design.

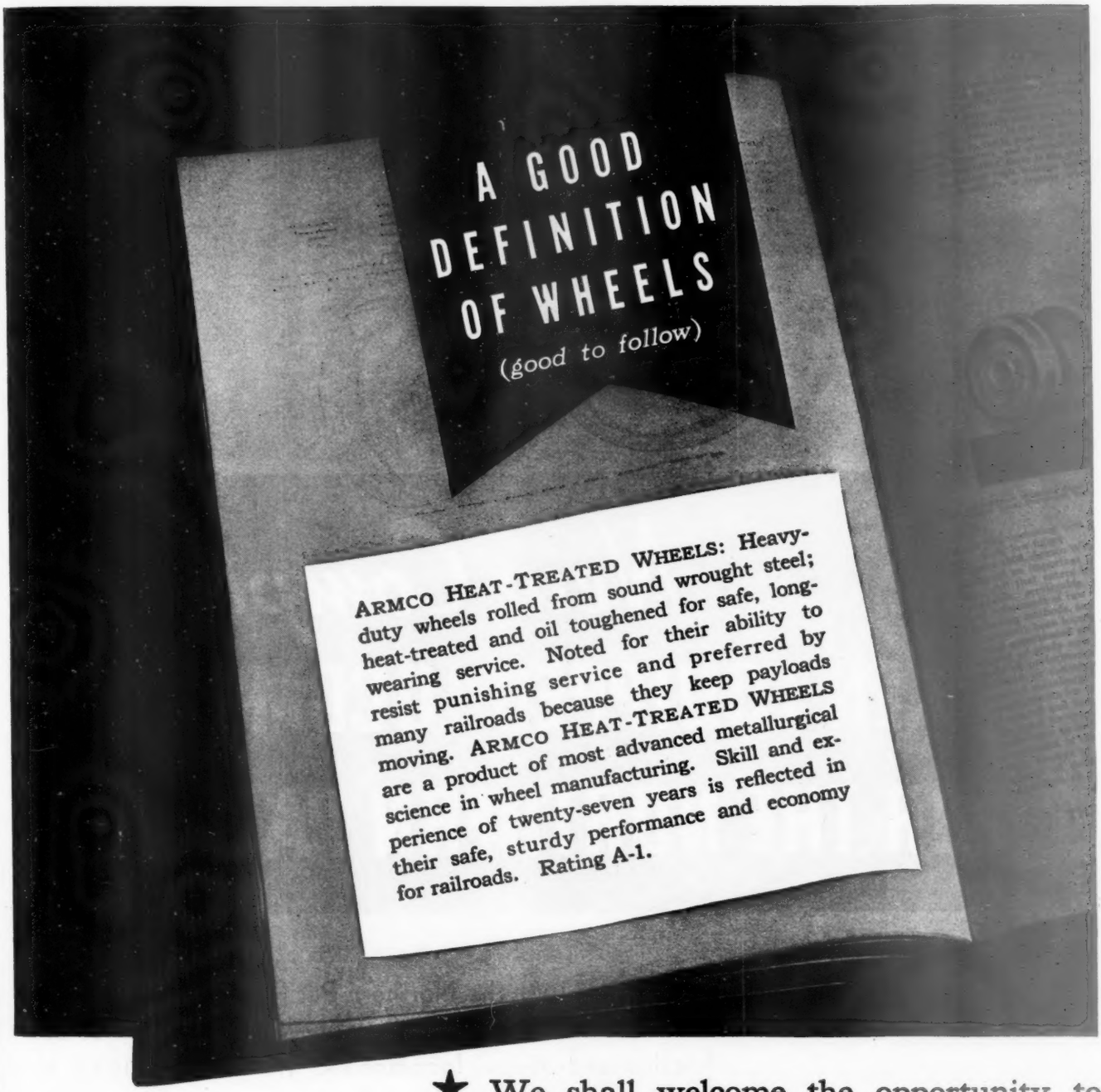
During the past three years we have analyzed the repair costs of more than 10,000 locomotives, covering more than 25,000 locomotive years. These studies show that there is an inexorably rising cost of repairs with the increasing physical age of locomotives.

On a locomotive 20 years old the cost of repairs per unit of work done will be nearly twice what it would be on an identical locomotive only three years old, and more than four times what it would be on an identical locomotive just installed in service.

New locomotives should therefore be bought to hold down the cost of repairs and to increase the profit of railroad operation.

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA



★ We shall welcome the opportunity to show that this definition of heavy-duty wheels is sound and profitable for you. Write us.

ARMCO RAILROAD SALES COMPANY

Subsidiary of The American Rolling Mill Company

Executive Offices:
Middletown, Ohio

DISTRICT OFFICES:
Chicago - Cleveland - New York
Philadelphia - St. Louis
San Francisco

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WHEELS · SHEETS · PLATES
for every Railroad need

PATENTED IN 1850

24 MILLION NOW IN SERVICE

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1. Albany Car Wheel Co.
2. American Car & Fdry. Co.
3. Bass Fdry. & Machine Co.
4. Canada Iron Foundries, Ltd.
5. Canadian Car & Fdry. Co.
6. Central Car Wheel Co.
7. Cleveland Production Co.
8. Dickson Car Wheel Co.
9. Dominion Wheel & Fdries., Ltd.
10. Griffin Wheel Co.
11. Hannibal Car Wheel & Fdry. Co.
12. Lobdell Car Wheel Co.
13. Louisville Car Wheel & Ry. Sup. Co.
14. Marshall Car Wheel & Fdry. Co.
15. Maryland Car Wheel Co.
16. Mt. Vernon Car Mfg. Co.
17. New Orleans Car Wheel Co.
18. New York Car Wheel Co.
19. Pullman Car & Mfg. Corp.
20. Ramapo Fdry. & Wheel Works
21. Reading Car Wheel Co.
22. Southern Wheel Co.
23. Tredegar Iron Works

New Equipment and Wheels

Reports and statistics show a substantial resumption of orders for new rolling stock.

This equipment should be equipped with wheels whose wearing surface of flange and tread causes the least abrasion to the rail. This is your assurance of wheel mileage.

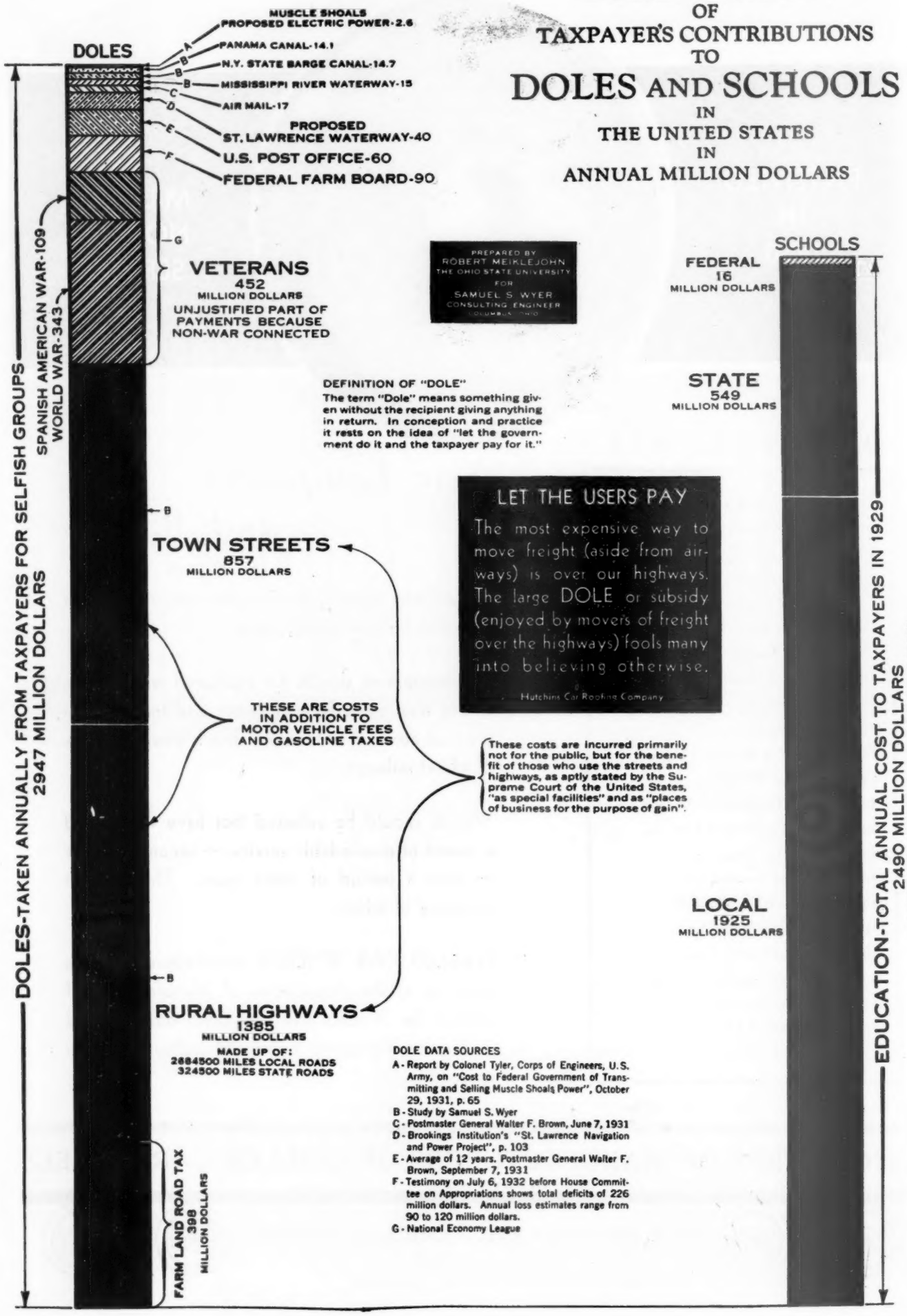
Wheels should be selected that have established a record of dependable service — second to none — over a period of many years. This is your assurance of safety.

CHILLED CAR WHEELS, manufactured by the members of the Association of Manufacturers of Chilled Car Wheels give you these qualities and the reason for there being 24 million now in service.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

332 S. MICHIGAN AVE. CHICAGO, ILLINOIS

COMPARISON OF TAXPAYER'S CONTRIBUTIONS TO DOLES AND SCHOOLS IN THE UNITED STATES IN ANNUAL MILLION DOLLARS



DOLE DATA SOURCES

A - Report by Colonel Tyler, Corps of Engineers, U.S. Army, on "Cost to Federal Government of Transmitting and Selling Muscle Shoals Power", October 29, 1931, p. 65

B - Study by Samuel S. Wyer

C - Postmaster General Walter F. Brown, June 7, 1931

D - Brookings Institution's "St. Lawrence Navigation and Power Project", p. 103

E - Average of 12 years. Postmaster General Walter F. Brown, September 7, 1931

F - Testimony on July 6, 1932 before House Committee on Appropriations shows total deficits of 226 million dollars. Annual loss estimates range from 90 to 120 million dollars.

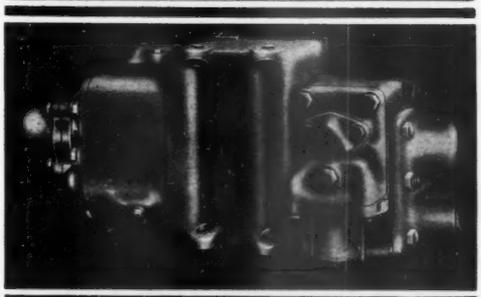
G - National Economy League

The "AB" BRAKE Cuts Railway Operating Costs

By—

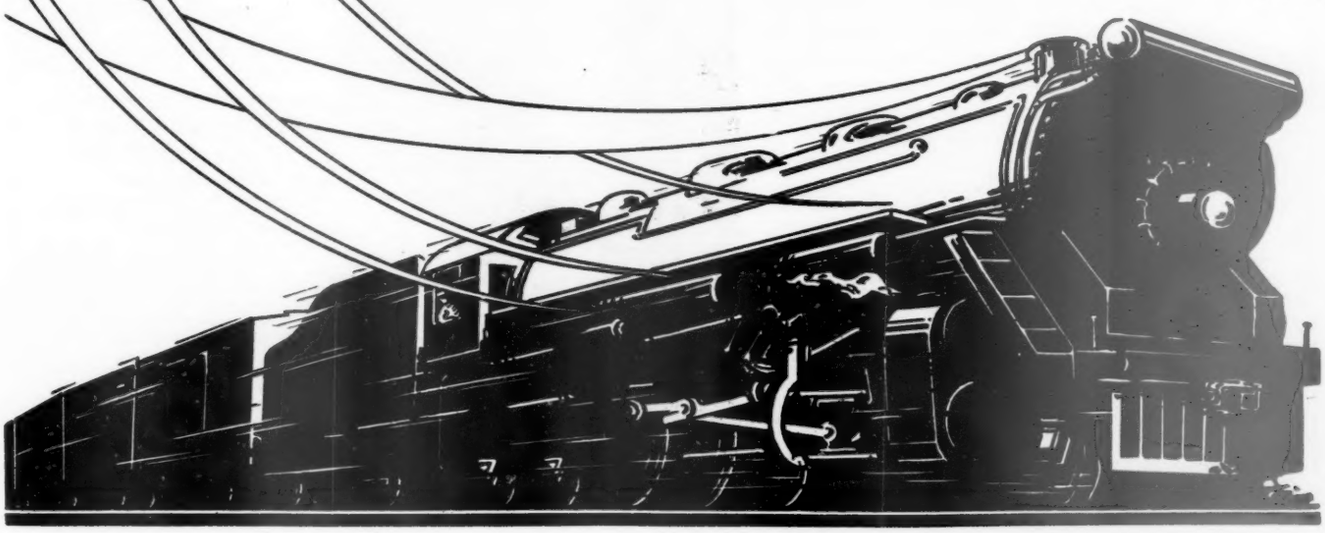
Heavier Tonnage Per Train

No. 3 of a Series.



BECAUSE all brakes in a train will apply quickly, positively, and with a substantial cylinder pressure; because serial action is very rapid; and because a more flexible control of cylinder pressure is possible for grade operation, trains of heavier tonnage than heretofore considered safe, can be handled with ease, and consequently *fewer* trains are required for a given volume of traffic.

WESTINGHOUSE AIR BRAKE CO.
General Office and Works **Wilmerding, Pa.**
(1260)



PROFESSIONAL DIRECTORY

GET TOGETHER DEPARTMENT

EDUCATIONAL

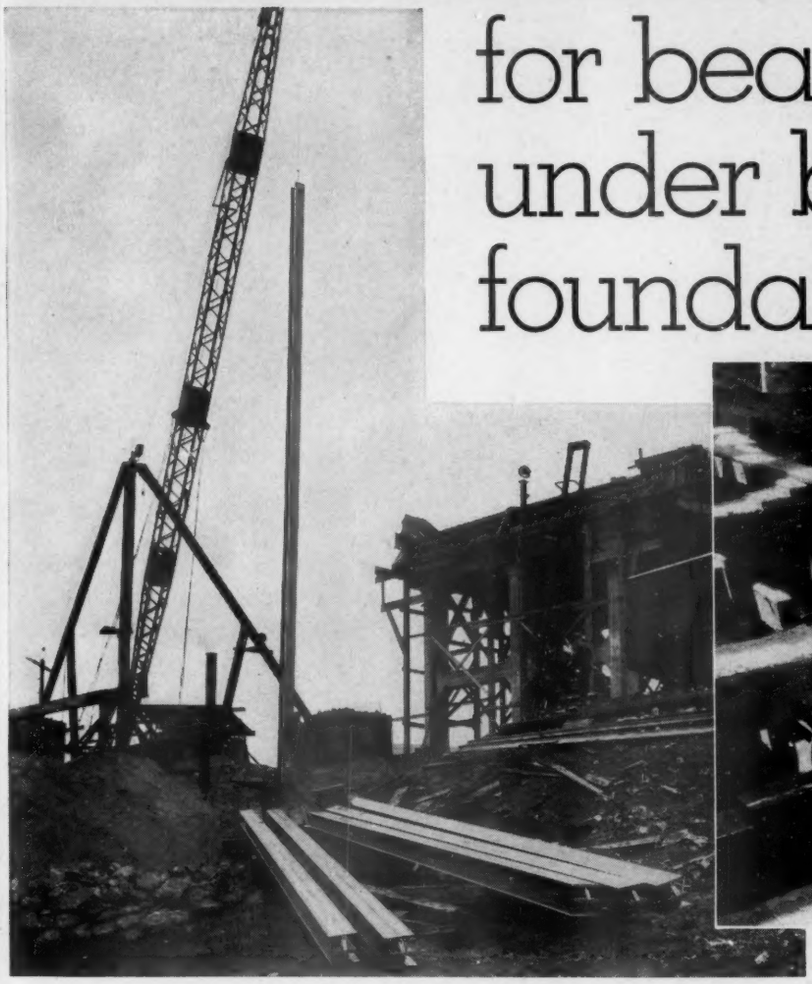
POSITION OPEN

Index to Advertisers

March 31, 1934

C B SECTIONS

for bearing piles under bridge foundations



One of the longer piles on the Kansas River Bridge, ready to be driven. Other shorter piles in the foreground show method of pointing and reinforcing web at lower end. Many of the piles were driven without this reinforcing or pointing and without any difficulties in driving.

A typical bell cluster of H-piles [C B Sections]. Driving has been completed. Note condition of tops. Kansas River Bridge built by Kansas State Highway Department. Designing Engineers: Sverdrup & Parcel. Contractors: Kansas City Bridge Company.

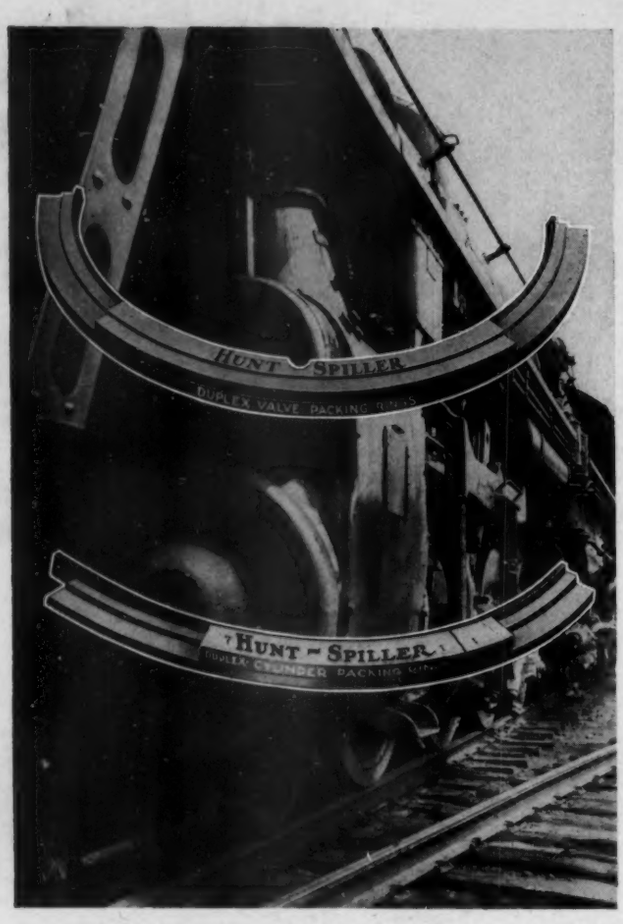
C B SECTIONS have been successfully employed as bearing piles under the foundations of a number of recently constructed bridges. Their use in the Kansas River Bridge at Kansas City, Kansas, illustrates the satisfactory manner in which these structural section H-piles meet certain conditions. 335 piles were used, ranging in length from 37 ft. to 81 ft. All were driven to uncompromising refusal and are believed to be seated well within heavy shale.

This and other applications of steel H-piles indicate that they are well suited for reaching bottoms otherwise economically inaccessible. Where hard driving conditions exist or where great lengths (up to 100 feet) are required, C B SECTIONS warrant thorough investigation. Our representatives will be glad to give further information.

Illinois Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

208 SOUTH LASALLE STREET CHICAGO, ILLINOIS



Two-Fold Economies *with* Duplex Packing

APPLICATION of HUNT-SPILLER ***Duplex*** Sectional Packing in the valves and cylinders assures savings in fuel and maintenance.

Leaks and blows which waste power and fuel cease to be a problem. The sections are held against the walls of the valve and cylinders by a scientifically heat-treated spring insuring steam tight operation.

The well balanced design of ***Duplex*** Packing, combined with the excellent qualities of HUNT-SPILLER ***Air Furnace*** GUN IRON provides a ring which resists internal stresses and high cylinder temperatures. Increased mileage between renewals has been effected on many roads.

Recommended designs for your power furnished upon request.

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J.G. Platt, Pres. & Gen. Mgr. V.W. Ellet, Vice-President

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383 Dorchester Ave. South Boston, 27, Mass.
Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

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Cylinder Bushings
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Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings

Parts Finished For Application

Dunbar Sectional Type Packing
Duplex Sectional Type Packing for Cylinders and Valves
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER *Air Furnace* GUN IRON